

Figure 17. Chinook salmon redd distribution in the Skykomish River: a) annual standardized redd densities, and b) trend for geometric mean (GM) of standardized redd densities. Data for (a) are from all years with six or more survey segments, and data for (b) are for all years in which data were collected for the segments shown during the period 1956 to 1998 (N ranges from 11 to 36). All values are plotted at the midpoint of segments.

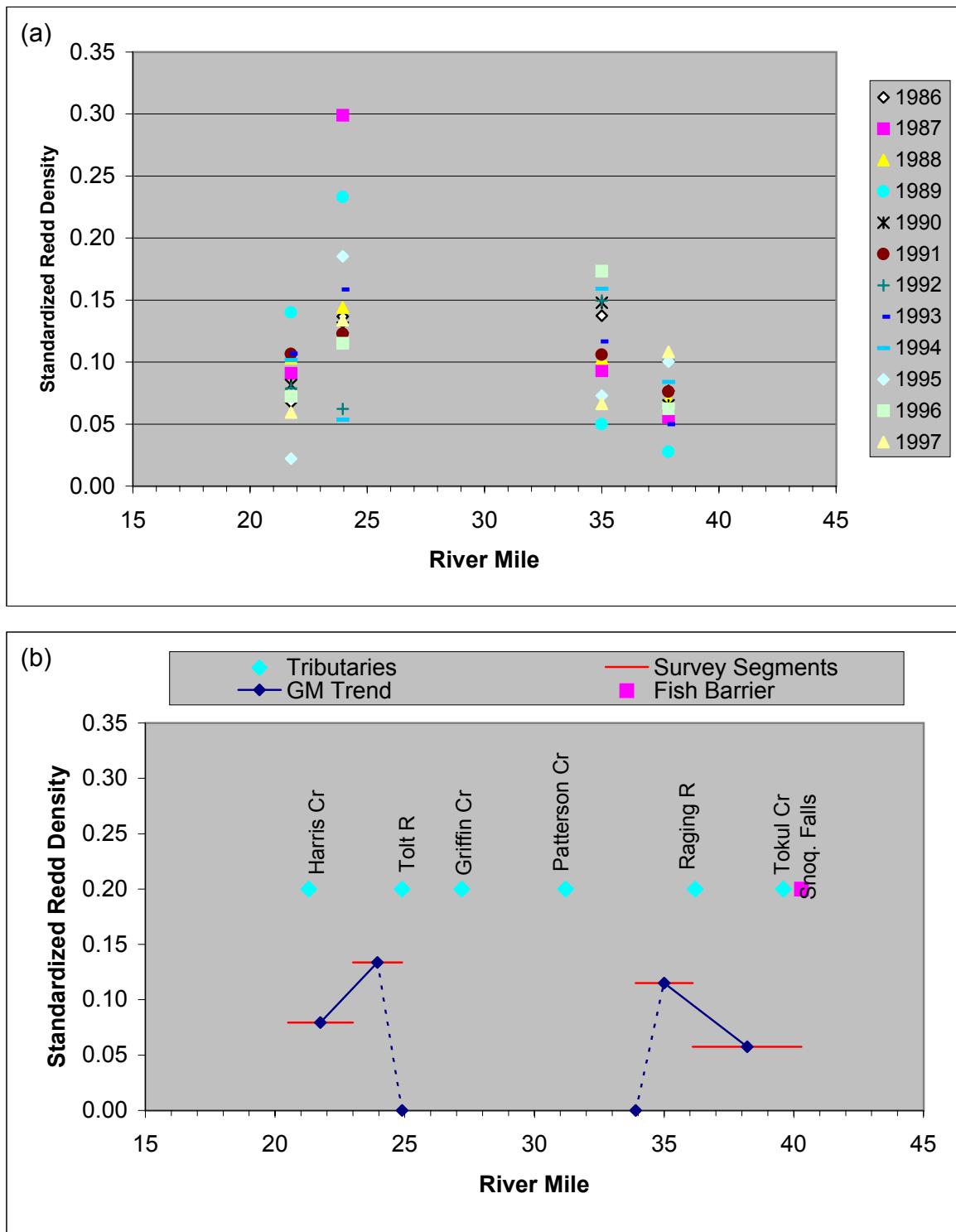


Figure 18. Chinook salmon redd distribution in the Snoqualmie River: a) annual standardized redd densities, and b) trend for geometric mean (GM) of standardized redd densities. Data are for all years with four survey segments ($N = 12$) and values are plotted at the midpoint of segments.

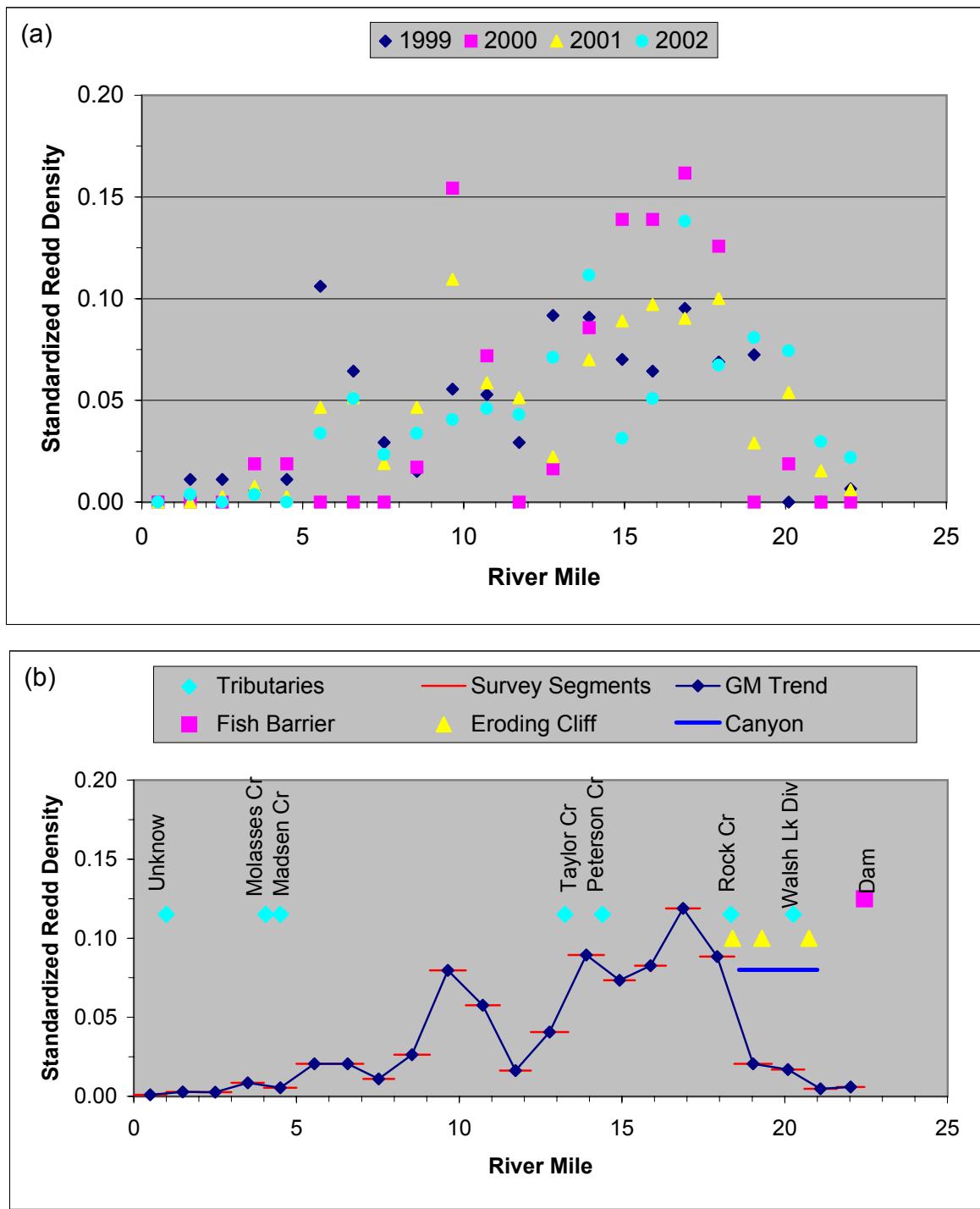


Figure 19. Chinook salmon redd distribution in the Cedar River: a) annual standardized redd densities, and b) trend for geometric mean (GM) of standardized redd densities for all years ($N = 4$). Data are plotted at the midpoint of segments.

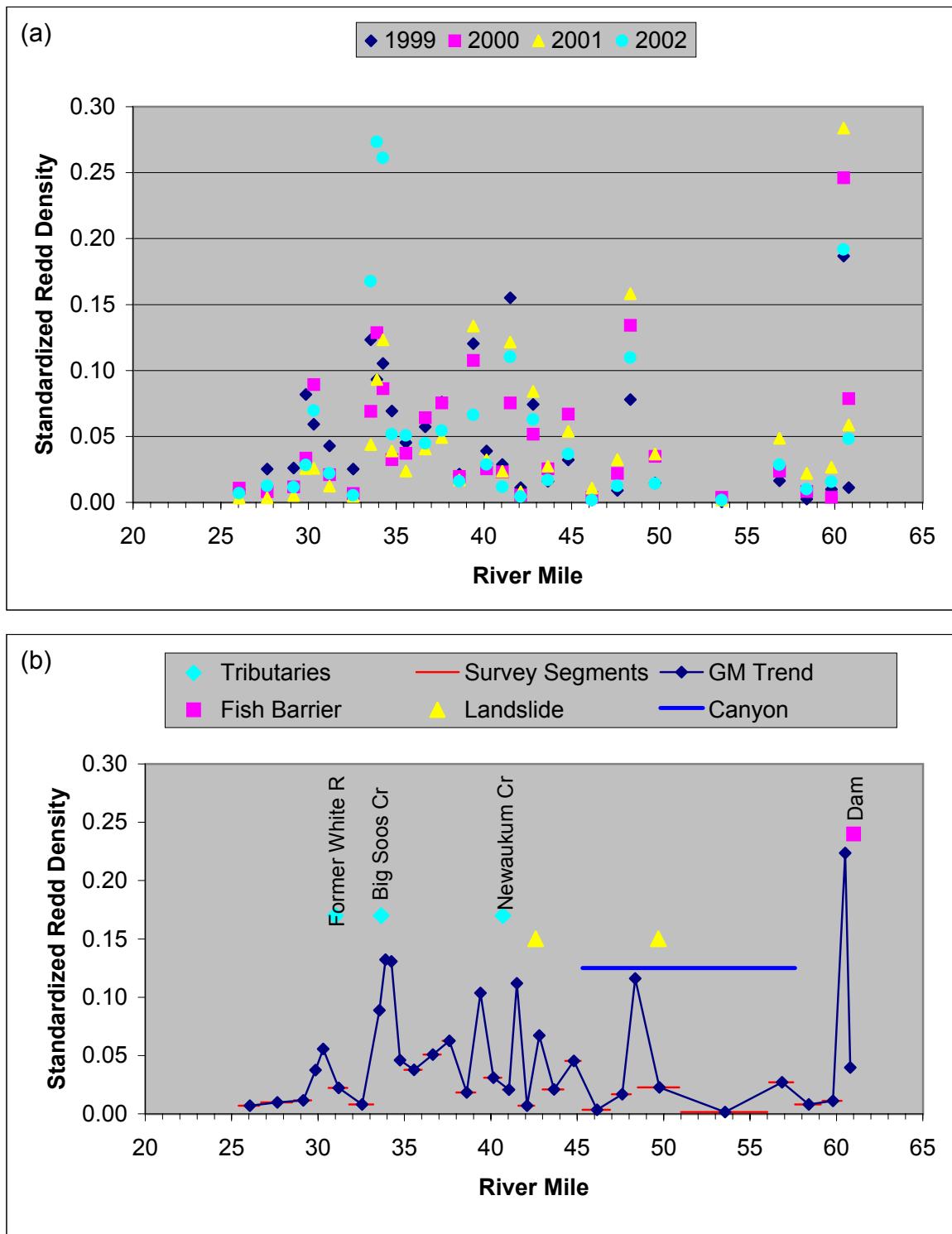


Figure 20. Chinook salmon redd distribution in the Green River: a) annual standardized redd densities, and b) trend for geometric mean (GM) of standardized redd densities for all years ($N = 4$). Data are plotted at the midpoint of segments.

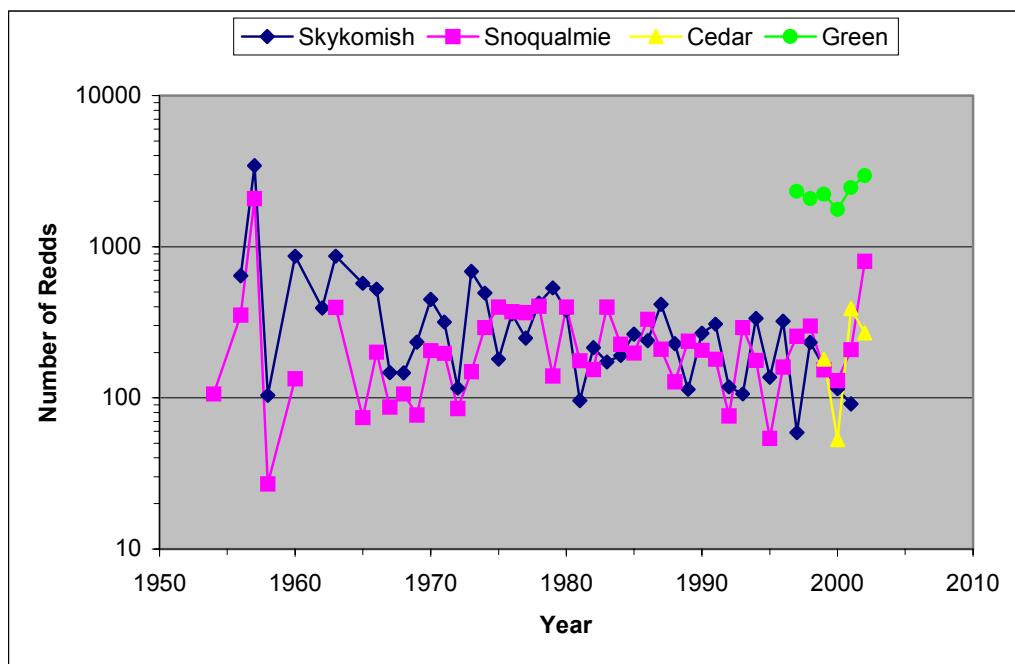


Figure 21. Peak annual redd counts for Chinook salmon in the Skykomish, Snoqualmie, Cedar, and Green Rivers.

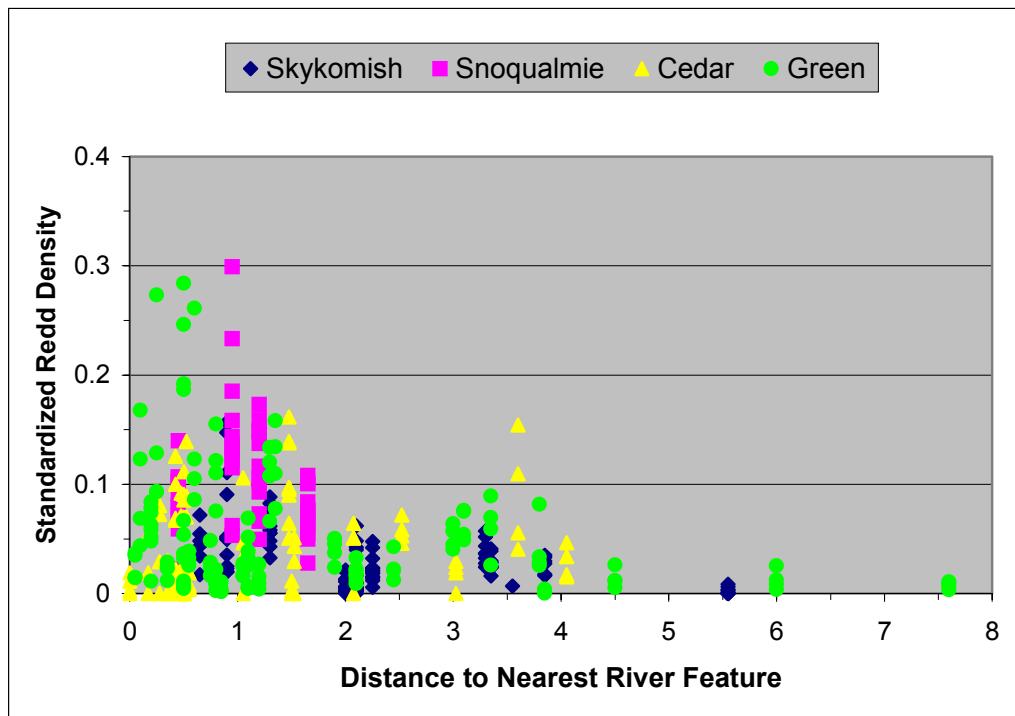


Figure 22. Chinook salmon standardized redd density as a function of distance to the nearest river feature for all study rivers. Plot based on all tributary and river feature data.

differences in the SRD are based on distance from river features, we divided the data into three distance categories (i.e., RMs 0 to 0.85, 0.85 to 2.0, and 2.0 to > 2.0) with approximately equal sample populations (Table 3). An ANOVA and multiple range test on these data show that the average SRD is significantly lower in segments that are greater than 2 mi (3.2 km) from any river feature than in segments closer to a feature (Tables 4 and 5).

Table 3. Summary statistics of standardized redd density by river feature distance category for the ANOVA test groups.

Test Group	Distance Category (RM)	Sample Size ^c	Minimum	Median	Mean	Maximum	Mean of Rankits
All data	< 0.85	130	0	0.044	0.059	0.28	0.139
	0.85 - 2.075	125	0	0.051	0.064	0.30	0.265
	> 2.075	124	0	0.022	0.027	0.15	-0.393
Select data	< 1.1	114	0	0.051	0.073	0.30	0.424
lg streams ^a	1.1 - 3.0	124	0	0.023	0.040	0.17	-0.157
	> 3.0	102	0	0.028	0.034	0.14	-0.275
Select data	< 1.3	106	0	0.051	0.070	0.30	0.454
lg streams	1.3 - 3.0	100	0	0.021	0.033	0.13	-0.241
	> 3.0	102	0	0.028	0.034	0.14	-0.227

^a Tributaries smaller than 5% size ratio and the Cedar River are excluded.

^b Same data as above, but data in segments adjacent to fish barriers are excluded.

^c Unequal sample sizes are inevitable because of multiple samples with equal distances.

Table 4. Analysis of variance test results of differences in Rankit-transformed standardized redd density among river feature distance categories.

Test Group	Source of Variation	Df	Sum of Sq	Mean Sq	F Value	Pr(F)
All data	Categories	2.00	30.43	15.21	1.72E+01	6.87E-08
	Residuals	376	331.9	0.8826		
Select data	Categories	2.00	31.24	15.62	1.75E+01	5.65E-08
	Residuals	337	300.1	0.8904		
lg streams ^a	Categories	2	32.86	16.43	18.81	1.99E-08
	Residuals	305	266.5	0.8738		
	no barriers ^b					

^a Tributaries smaller than 5% size ratio and the Cedar River are excluded.

^b Same data as above, but data in segments adjacent to fish barriers are excluded.

Table 5. Results of Tukey multiple comparisons tests of Rankit-transformed standardized redd densities for three different river feature distance categories and two test groups.

Test Group	Category Comparison			Estimate	Std. Error	Tukey Statistic ^c	Significant
All data	< 0.85	vs	0.85 - 2.075	-0.1260	0.118	-1.07	no
	< 0.85	vs	> 2.075	0.532	0.118	4.51	yes
	0.85 - 2.075	vs	> 2.075	0.658	0.119	5.53	yes
Select data lg streams ^a	< 1.1	vs	1.1 - 3.0	0.5810	0.122	4.76	yes
	< 1.1	vs	> 3.0	0.699	0.129	5.42	yes
	1.1 - 3.0	vs	> 3.0	0.118	0.126	0.94	no
Select data	< 1.3	vs	1.3 - 3.0	0.6950	0.13	5.35	yes
lg streams	< 1.3	vs	> 3.0	0.680	0.13	5.23	yes
no barriers ^b	1.3 - 3.0	vs	> 3.0	-0.014	0.132	-0.11	no

^a Tributaries smaller than 5% size ratio and Cedar River are excluded.

^b Same data as above, but data in segments adjacent to fish barriers are excluded.

^c Critical point: 2.353.

When we looked at the trend in SRD as a function of distance in each river, we found that certain features are more important than others and that the pattern of association is more evident in some rivers. In the Skykomish River, the highest SRD occurs in segments that are close (i.e., < 1.3 mi or < 2.0 km) to the Sultan River and the fish barrier at Sunset Falls (Figure 23). In the Green River, the results are similar with the highest SRD occurring in segments that are close to two tributaries (Big Soos and Newaukum creeks), the fish barrier at Howard Hansen Dam, and two landslides (Figure 24).

In the Snoqualmie River, we detected an association between SRD and two of the largest tributaries (i.e., Tolt and Raging rivers). Within the surveyed segments, the SRD declined at distances > 1.3 mi (> 2.0 km) from these tributary junctions (Figure 25a). This trend is more evident when Harris Creek is removed from the evaluation (Figure 25b). Harris Creek is relatively small (2% subbasin size ratio, Table 2) and was not predicted to affect channel morphology, as indicated above. Therefore, including Harris Creek in the evaluation masks the association between redd density and distance to the Tolt River, which has a large potential effect on habitat (19% subbasin size ratio). If Harris Creek were influencing the SRD, then the trend shown for the Tolt River after Harris Creek was removed (Figure 25b) would probably be more obscure.

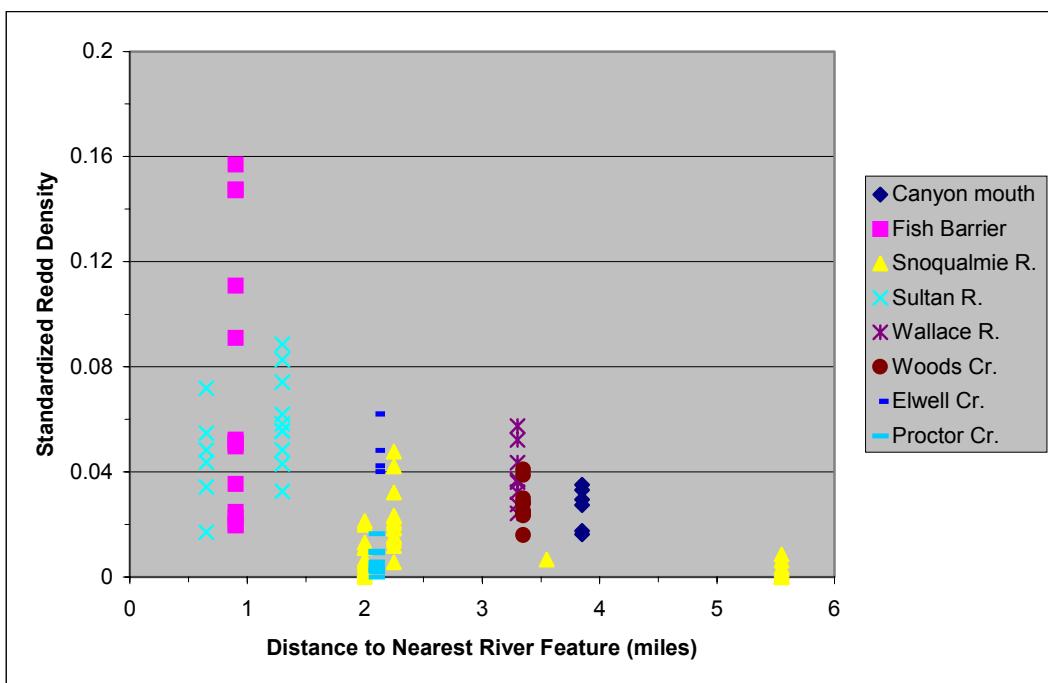


Figure 23. Chinook salmon standardized redd density as a function of distance to nearest river feature in the Skykomish River. Plot based on all data.

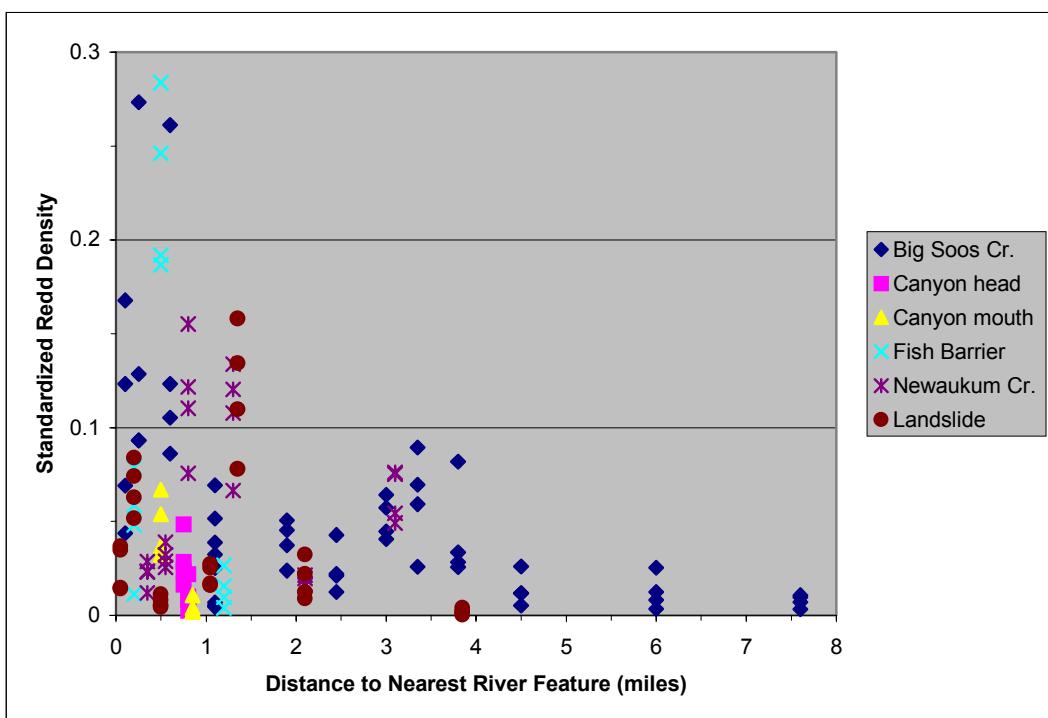


Figure 24. Chinook salmon standardized redd density as a function of distance to nearest river feature in the Green River. Plot based on all data.

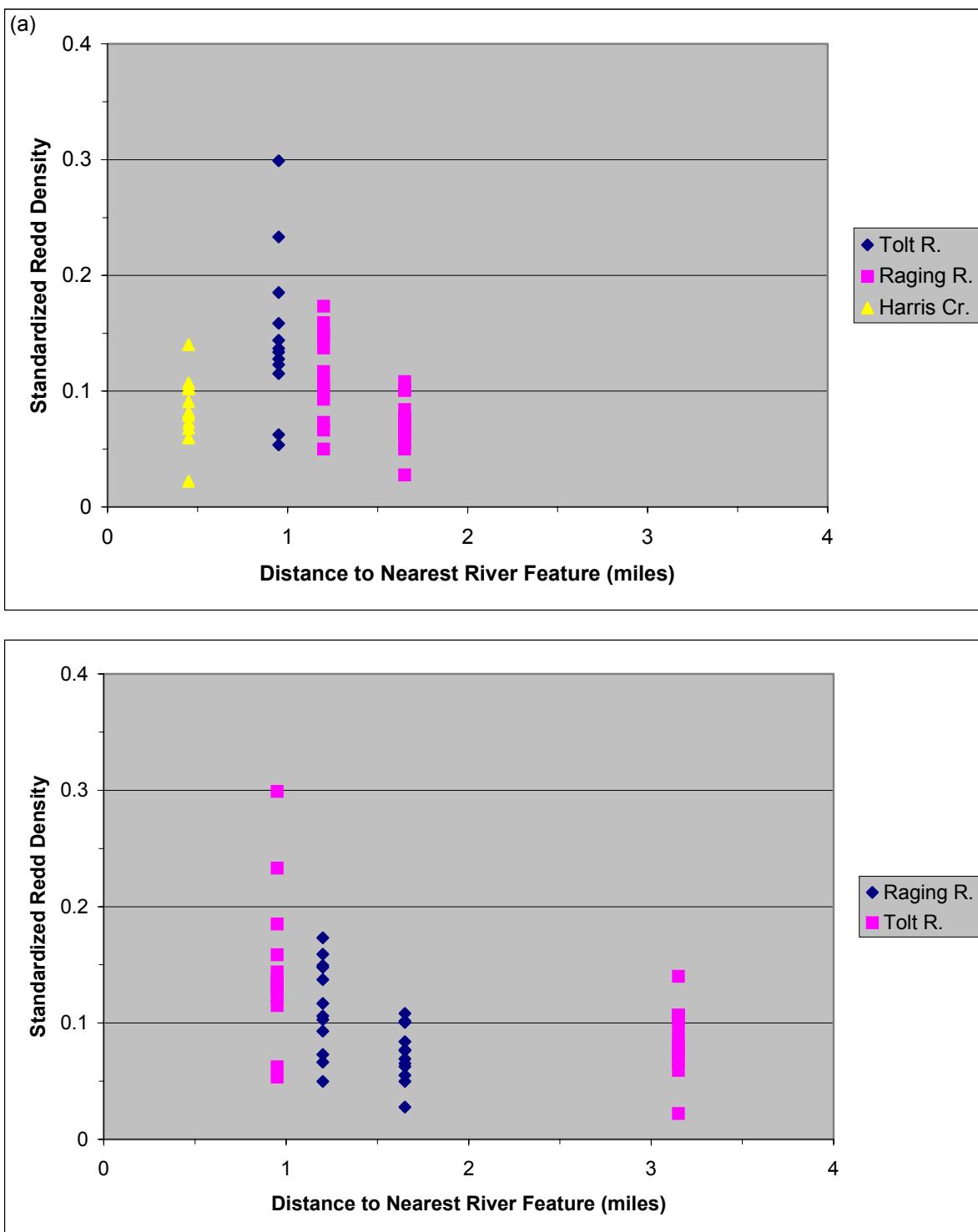


Figure 25. Chinook salmon standardized redd density as a function of distance to nearest river feature in the Snoqualmie River. Plot (a) based on all data and plot (b) excludes tributaries with a subbasin size ratio < 5%.

The SRD patterns in the Cedar River showed no apparent trend with distance from any river feature (Figure 26a). This result is confusing because spatial patterns of redd abundance are distinct in the Cedar River (Figure 19 and Table 6). Either the features that we evaluated have no influence on spatial patterns or the association is not evident because certain features may mask the effect of others in the nearest neighbor analysis. The latter factor may be true because all of the tributaries to the Cedar River are small ($\leq 3\%$ subbasin size ratio, Table 2) and were not predicted to influence habitat. Therefore, if we remove tributaries from the evaluation, the eroding cliffs, canyon, and fish barrier are the only remaining features. An evaluation with these features suggests that SRD declines with distance from the eroding cliffs or the canyon mouth (i.e., both occur at the same location), but this association may also be an artifact of the feature locations (Figure 26b). The high SRDs that occur close to the eroding cliffs and canyon suggest there is an association with these features, but the high SRDs that also occur farther downstream suggest that some other features that were not included in the evaluation (e.g., valley constriction at RM 9.2 to 10.3 or hyporheic exchange) are influencing redd abundance.

The results suggest that tributary size has a strong influence on the location of spawning patches. In the Skykomish, Snoqualmie, and Green rivers, all of the tributaries that were close to segments with high SRD had subbasin size ratios ranging from 8% to 28% (Table 2). In the Cedar River, where we did not see any association between spawning patches and tributaries, the subbasin size ratio was small (i.e., $< 3\%$). Therefore, to evaluate the effects of tributary size, we plotted the SRD as a function of distance from the nearest river feature but excluded all tributaries having a subbasin size ratio $< 5\%$ (Figure 27a). We chose a size ratio of 5% because it is the approximate midpoint in basin size between basins where we did and did not detect an effect on the SRD (i.e., between 3% and 8% subbasin size ratio). We divided the data for the large tributaries and other river features into three distance categories (i.e., RMs 0 to 1.1, 1.1 to 3.0, and > 3.0) with approximately equal sample populations (Table 3) and tested for differences in the average SRD using an ANOVA and multiple range test. This analysis showed that the average SRD is significantly greater in segments that are less than 1.1 mi (1.8 km) from either a larger tributary or other river feature and that there are no differences in average SRD for distances categories that were greater than 1.3 mi from large tributaries and other features.

Because high SRDs in the Skykomish and Green rivers were strongly associated with fish barriers, it is unclear whether the statistical differences we detected among distance categories is a result of high redd densities that are associated with large tributaries, other features, or fish barriers. To evaluate the influence of river features without fish barriers, we repeated the analysis for larger tributaries but excluded all data from survey segments that were adjacent to fish barriers (Figure 27b). Data were divided into three distance categories (i.e., RMs 0 to 1.3, 1.3 to 3.0, and > 3.0) with approximately equal sample populations (Table 3) and tested for differences in the average SRD using an ANOVA and multiple range test. The results were consistent with previous tests and showed that the average SRD is significantly greater in segments that are close (< 1.3 mi or < 2.0 km) to the larger tributaries and river features other than fish barriers.

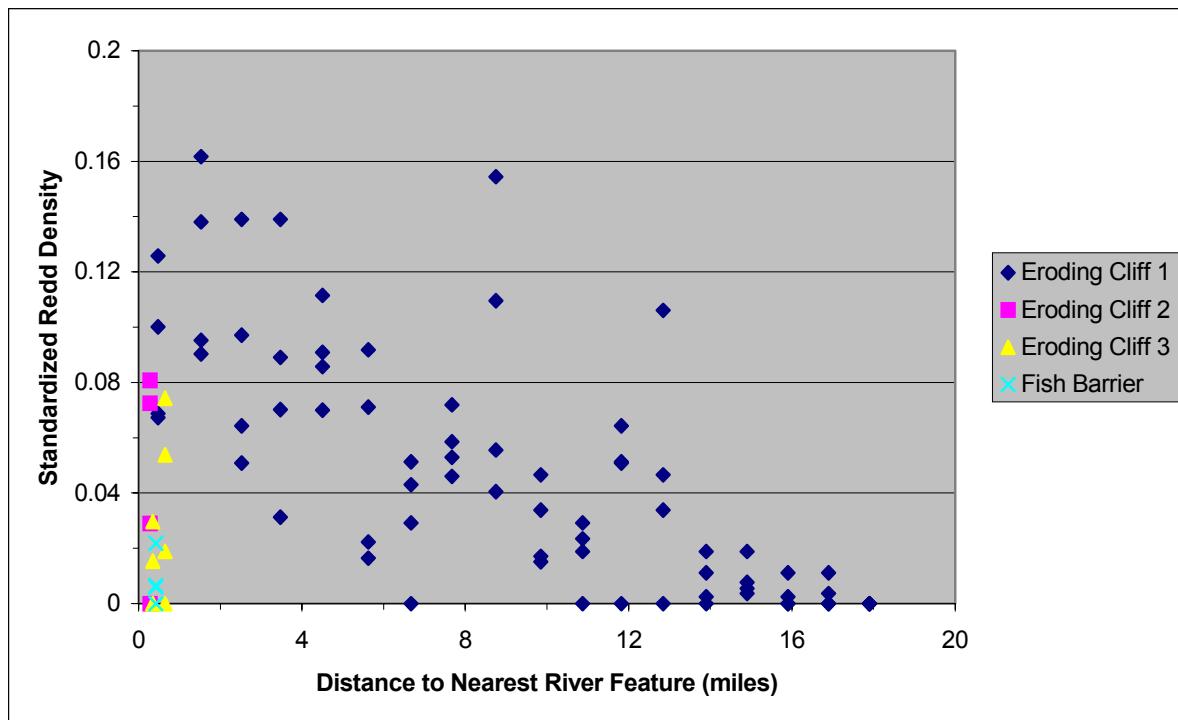
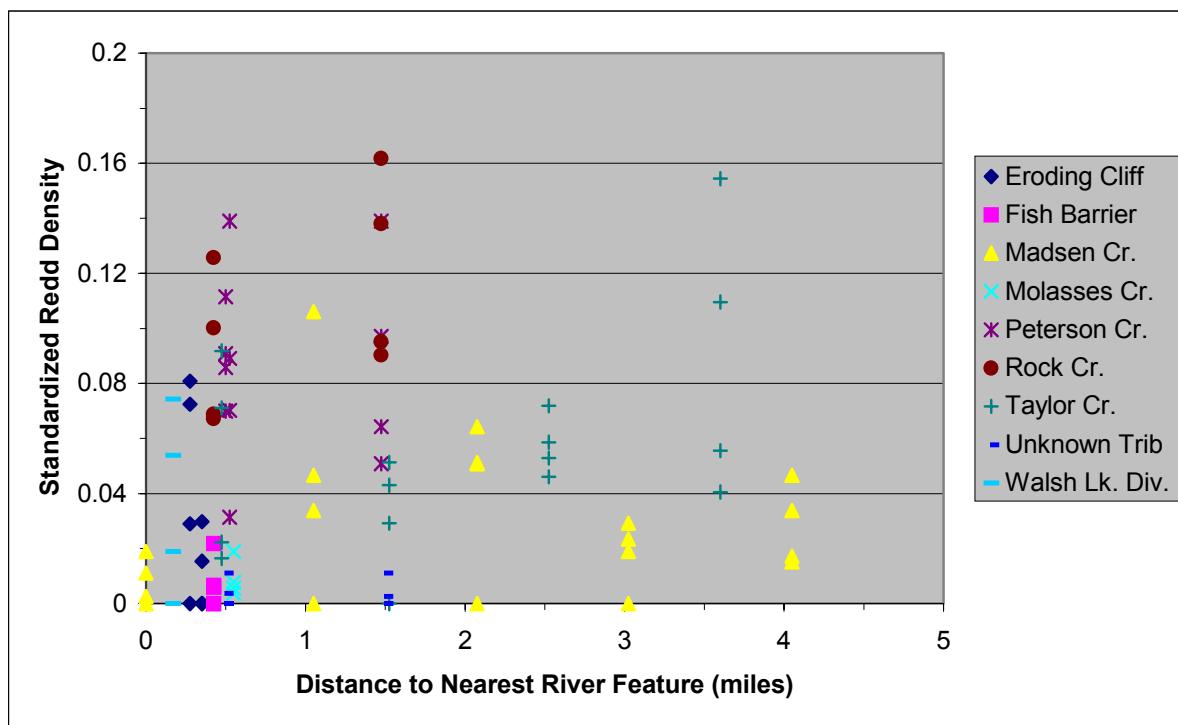


Figure 26. Chinook salmon standardized redd density as a function of distance to nearest river feature in the Cedar River. Plot (a) based on all data and plot (b) excludes all tributary features.

Table 6. Chinook salmon spawning patch location, length, and inter-patch distance.

River	Patch Location and Characteristics (RM) ^a				
	Lower end	Upper end	Center	Length	Inter-patch distance
Skykomish	31.8	34.4	33.10	2.6	6.6
	35.7	43.6	39.65	7.9	10.9 ^b
	49.6	51.5	50.55	1.9	
Snoqualmie	20.5	24.9	22.70	4.4	14.4
	33.9	40.3	37.10	6.4	
Cedar	5.0	7.1	6.03	2.1	4.2
	9.1	11.3	10.18	2.2	3.7
	13.4	14.5	13.90	1.1	3.5
	16.4	18.5	17.40	2.1	
Green	29.7	30.5	30.10	0.8	3.7
	33.3	34.4	33.85	1.1	3.7
	37.2	37.9	37.55	0.7	1.8
	39.2	39.5	39.35	0.3	2.1
	41.4	41.5	41.45	0.1	1.3
	42.6	42.9	42.75	0.3	2.0
	44.3	45.2	44.75	0.9	3.6
	48.2	48.4	48.30	0.2	8.5 ^b
	56.1	57.5	56.80	1.4	3.7 ^b
	60.4	60.5	60.45	0.1 ^c	

^a Patch characteristics are dependent on survey segment resolution, which is variable among the study rivers; see discussion in text.

^b Inter-patch distance influenced by patch location relative to canyon.

^c Patch length influenced by dam location.

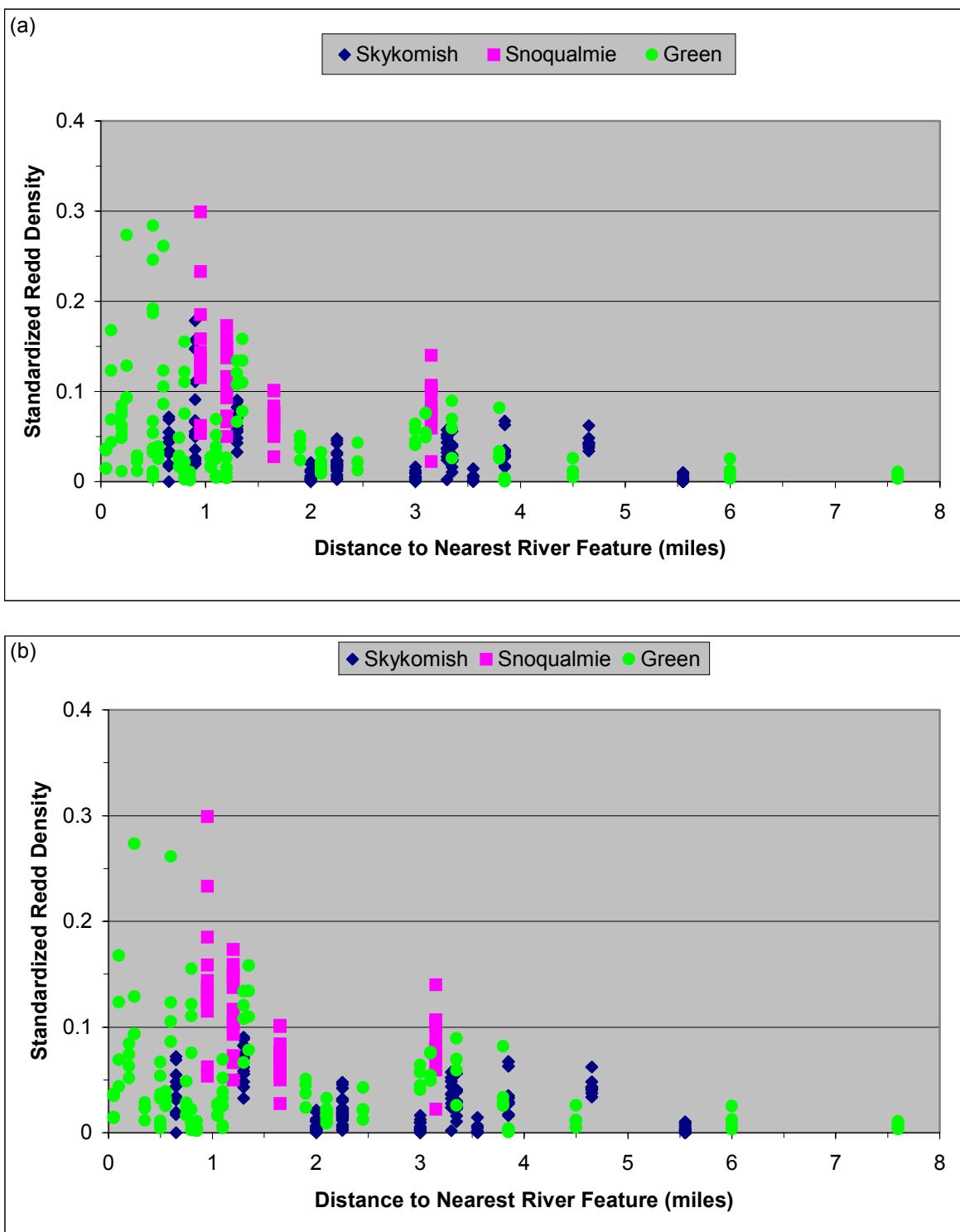


Figure 27. Chinook salmon standardized redd density as a function of distance to the nearest river feature for three study rivers with large tributaries. Plot (a) based on all data excluding tributaries with a subbasin size ratio < 5% and excluding the Cedar River. Plot (b) based on same data as plot (a) but also excludes data from segments adjacent to fish barriers.

DISTRIBUTION OF SPAWNING HABITATS COMPARED TO PREDICTIONS

The spatial structure of Chinook spawning habitat that we observed in the study rivers was consistent with the four general predictions made by the geomorphic framework. Specifically, we found the following:

- Spatial patterns in redd densities were non-uniformly distributed at the scale of confluences, canyons, and landslides.
- Locations of habitat patches (i.e., core areas) were strongly associated with specific tributary junctions, canyon mouths, and landslides.
- Habitat patch sizes (i.e., core areas) and the distance between them (i.e., spatial scale of variation) varied in relation to basin size, basin topography, and network geometry.

High redd densities were associated with geomorphically significant tributaries that were predicted by the model (Chapter 2). Based on previous research, we assumed that a P value no less than 0.76 would influence spawning habitat, but our analysis showed that a minimum P value of 0.84 was associated with high SRD (Table 2). However, not all the tributaries with a high P value were associated with high SRDs. Several large tributaries (i.e., high P values) have low sediment transport potential (i.e., Snoqualmie River, Woods Creek, Cherry Creek) and therefore were not associated with dense spawning patches.

The strong association between SRD and landslides in the Cedar and Green rivers is consistent with our predictions and with the results of gravel supply studies. The eroding cliffs in the Cedar River and the large deep-seated landslides in the Green River provide significant inputs of spawning gravel to the system and contribute to the formation of large spawning patches (Perkins 2000, Perkins Geoscience and R. H. Righellis, Inc. 2002, R2 Resource Consultants, Inc. 2002).

The predicted association between canyons and spawning patches was observed but was difficult to verify with this analysis. Spawning patches were predicted at the mouth of canyons where valleys transitioned to floodplains. In the Skykomish, Cedar, and Green rivers, the data indicated high SRDs just downstream of the canyon mouths, but we did not detect an association with these features in the nearest neighbor analysis. The latter result may be a consequence of interference from other features (e.g., tributaries and landslides occur below the canyons in the Cedar and Green rivers) that are close by. In rivers where multiple features occur in close proximity, it is difficult to separate the effects among features without smaller-scale measurements and site specific information.

The geomorphic framework did not predict spawning patches near the fish barriers, although high SRDs near these features in the Skykomish and Green rivers suggest the barriers may affect redd density. The valley morphology directly below all of the fish barriers was either within a canyon or within a moderately confined valley with no large tributary junctions. Given the topographic scale of this analysis, we predicted that spawning habitat would be limited in these areas. Site specific information indicates that the streambed substrate for 3 miles below the dam on the Cedar River is mostly composed of cobble and boulders with a few small patches of

gravel (Perkins Geoscience and R. H. Righellis, Inc. 2002), and in the Snoqualmie River, the streambed is mostly composed of boulders and bedrock between the falls and Tokul Creek (Haring 2002). In the South Fork Skykomish River, there is one gravel bar just below Sunset Falls (apparent on aerial photographs) that is formed at the head of the canyon and in the Green River, a couple of short floodplain segments with gravel patches and a bedrock outcrop creates a gravel bar in the reach below the dam (R2 Resource Consultants, Inc. 2002). These spawning patches are not large relative to the size of patches downstream in the same rivers, yet redd densities were relatively high. One reason for these high redd densities at the Skykomish and Green river fish barriers and not at the others is the influence of fish enhancement. Fish managers have extended the wild population to upstream habitats in these rivers (Kerwin and Nelson 2001, Haring 2002) by transferring adult salmon over these barriers. Therefore, significant numbers of Chinook salmon are returning to the Skykomish and Green river fish barriers because a portion of the population is attempting to return to their natal habitat upstream. The concentration of adults below these barriers has probably increased the utilization of adjacent spawning habitat over natural levels. Variation in enhancement activities over time (e.g., number and timing of adult transfers or supplementation with hatchery outplants) may account for the relatively high annual variability in SRD that we observed in segments below barriers in the Skykomish and Green rivers (Figures 17a and 20a) compared to that below barriers in the Snoqualmie and Cedar rivers (Figures 18a and 19a).

OTHER FACTORS POTENTIALLY INFLUENCING CHINOOK SALMON SPATIAL PATTERNS OF SPAWNING

In addition to river habitat features, we recognize there are a variety of other factors that could influence the spatial patterns of spawning by Chinook salmon. Below we discuss how hatcheries, species interactions, and harvest management activities may be influencing the spatial distribution of redds that we observed in this study.

The presence of Chinook salmon hatcheries and juvenile release sites in the Skykomish and Green river systems may be influencing spatial patterns of spawning by concentrating spawning adults at locations that may or may not support high natural production. The high SRD that we observed near the landslide deposit at RM 49.7 on the Green River may be more a function of this location's close proximity to the juvenile release site at Icy Creek (RM 48.4) rather than from natural production in the slide deposit zone. Similarly, the high SRD that we observed near the junctions of tributaries with hatcheries (i.e., Wallace River on Skykomish and Big Soos Creek on Green River, Figures 17 and 20) may be partly due to the high concentration of spawners that home to these river segments. For example, recent investigations indicate that offspring from the Big Soos Hatchery contribute significantly to natural redd production in the Green River (Unpublished coded wire tag data from Tom Cropp, WDFW, personal communication, 6/16/03). Therefore, it is probable that hatchery production influences the SRD level at hatchery tributary junctions. However, because these hatcheries occur in tributaries with geomorphically significant mainstem tributary junctions, we would expect to see high SRDs in association with the large spawning gravel patches, regardless of hatchery supplementation.

Spatial patterns of Chinook spawning may also be influenced by biological factors, such as competition for spawning habitat with other species or by egg mortality due to redd superimposition of a later spawning and/or more aggressive species. This interaction between

species is perhaps most evident in the Cedar River, where the escapement of sockeye salmon is two to three orders of magnitude greater than the escapement of Chinook and the spawning periods for both species overlap (Kerwin 2001). For example, the potential for Chinook embryo mortality is a major concern because Burton et al. (2003) documented that Chinook redd superimposition by sockeye ranged from 0.8% to 88% and that rates of superimposition were directly associated with levels of sockeye escapement. They observed that the majority of Chinook redds were located in areas that were not utilized by sockeye until after the Chinook spawning activity had finished. Burton et al. (2003) suggest that the Chinook spawning sites may be less favorable to sockeye because of larger substrate size and high velocity and that the presence of a Chinook redd may facilitate sockeye spawning by loosening up the substrate. The actual effect of redd superimposition on Chinook embryo mortality, however, is not known and is only assumed from information showing that the average depth of a sockeye egg pocket is deep enough to penetrate into an average Chinook egg pocket (see documentation, Burton et al. 2003). It is conceivable that persistent Chinook egg mortality from sockeye redd superimposition could cause Chinook spawners to seek habitat (e.g., large substrate, higher velocity) that is less favorable to sockeye. Therefore the current spatial pattern of Chinook redds in the Cedar River may be more a function of their interaction with sockeye and less a function of channel geomorphology or habitat forming processes.

Finally, harvest that differentially influences escapement of geographically distinct subpopulations or individuals may have an influence on spatial patterns by restricting or eliminating environmental adaptations that are unique to the natal watershed. For example, harvest management regimes that are based on the annual strength of the largest stock may result in over harvest of smaller subpopulations that are uniquely adapted to a particular subbasin or segment in a large watershed. Therefore, spatial patterns of spawning that are driven by natal homing characteristics of different subunits may be lost or altered until the affected population recovers or new populations adapt and fill the underutilized niche. The differential harvest of adults that favors escapement of smaller/younger individuals may also influence spatial patterns of spawning as a result of restrictions on the individuals' capability for migration or redd construction. Smaller adults may be less capable of ascending barriers, therefore restricting access to spawning in certain habitat. Also, smaller adults are less capable of digging redds in larger substrate that is commonly used by Chinook, therefore limiting where the population may spawn. This can cause spawners to utilize areas that are favorable to smaller species (e.g., sockeye) resulting in competition and a greater susceptibility to redd superimposition, as noted above.

PREDICTING CORE AREAS FOR CHINOOK SALMON IN THE UPPER GREEN RIVER

The Howard Hanson diversion dam blocks the migration of salmon to the upper reaches of the Green River. Nevertheless, we make predictions about the spatial distribution of spawning Chinook salmon based on geomorphically significant tributary confluences, landslides, and canyon mouths. The ESI network model in conjunction with a logistic regression equation (Chapter 2) was used to predict the probability of confluence effects greater than 0.5 in Figure 28a. Aerial photographs and the network model were used to map canyon mouths (either canyon transitioning into floodplain segment or floodplain segment transitioning into a canyon) and large, deep-seated landslides (Figure 28a).

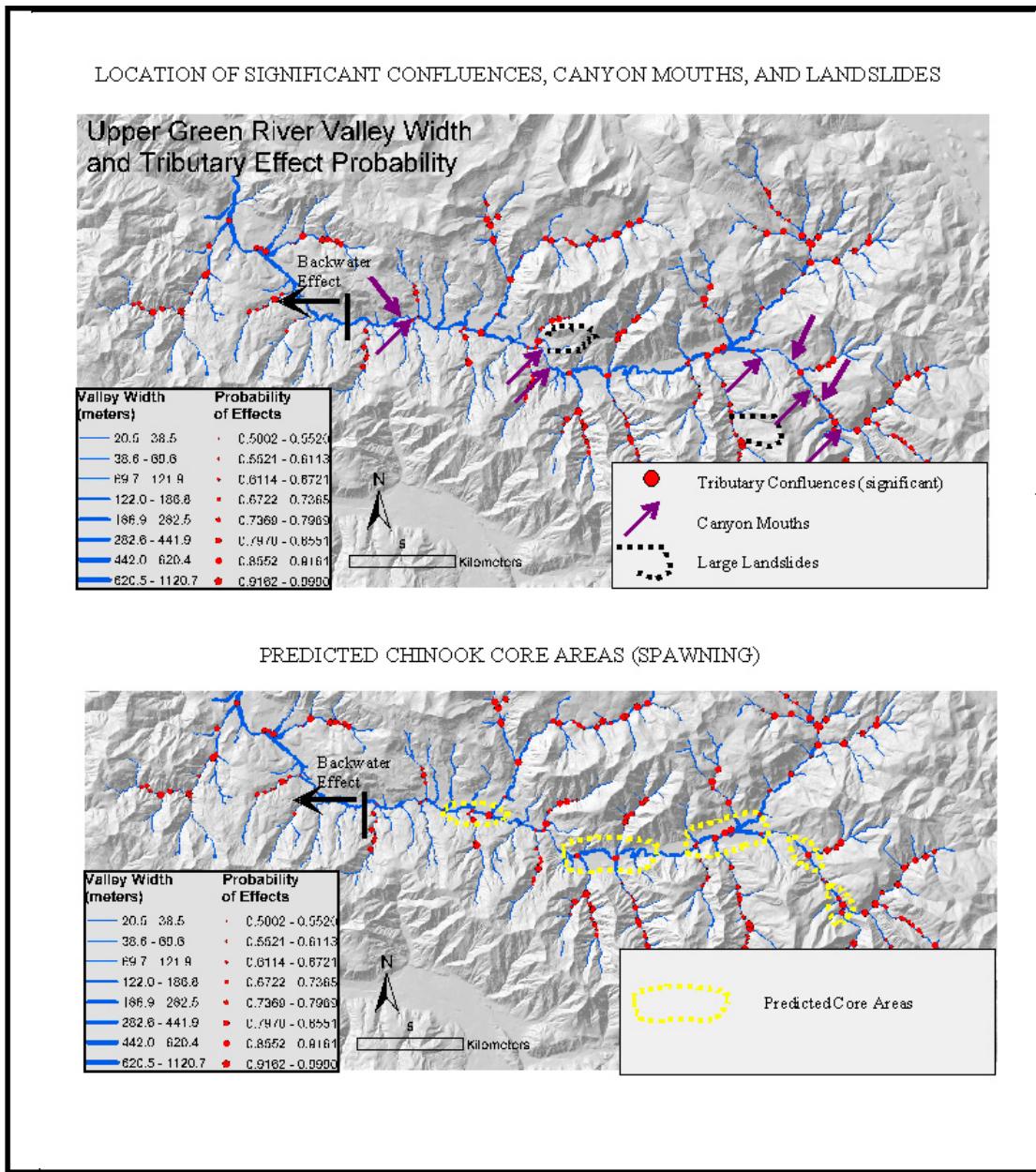


Figure 28. Upper Green River; a) location of significant confluences, canyon mouths, and landslides, and b) predicted core areas for Chinook salmon spawning.

Four distinct canyons and two large deep-seated landslides, in addition to the prediction of geomorphically significant tributary confluence, were used to predict the locations of core areas for spawning Chinook salmon. The previous analysis of the non-uniform distribution of spawning Chinook salmon in the lower Skykomish, Snoqualmie, Green, and Cedar rivers indicated that tributaries with a P value of greater than 0.8 are most likely to be associated with high concentrations of spawning Chinook. Five distinct core areas are predicted to exist in the upper Green River along the mainstem (only the mainstem Green River was evaluated) that are associated with single or multiple, closely spaced large tributary confluences (i.e., $P \geq 0.8$),

canyon mouths, and landslides (Figure 28b). The core areas are approximately 3 to 5 km long and are separated by a similar length scale. The separation distance of the predicted core areas driven by confluences is predicted to be less than in the lower Green River and much less compared to core area separation in the larger rivers of the Skykomish and Snoqualmie rivers. A pattern of decreasing distance between geomorphically significant tributary confluences with decreasing watershed size is predicted based on rules of network geometry (Chapter 2).

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Appendix

Annual Peak Counts of Chinook Salmon Redds by Survey Segment

Annual peak counts of Chinook salmon redds by survey segment. Data were excluded for years with incomplete surveys. River mile (RM) location is based on Washington Stream Catalog (Williams et al. 1975).

WRIA	River	Lower		RM Midpt	Seg		Count	Redd/mi	^a Std. Density
		RM	Upper RM		Length	Year			
7	Skykomish	20.5	25	22.75	4.5	1956	130	28.9	0.045
7	Skykomish	25	34.4	29.7	9.4	1956	354	37.7	0.058
7	Skykomish	34.4	43.3	38.85	8.9	1956	145	16.3	0.025
7	Skykomish	44.5	49.6	47.05	5.1	1956	8	1.6	0.002
7	Skykomish	49.6	51.5	50.55	1.9	1956	7	3.7	0.006
7	Skykomish	20.5	25	22.75	4.5	1957	620	137.8	0.040
7	Skykomish	25	34.4	29.7	9.4	1957	1840	195.7	0.057
7	Skykomish	34.4	43.3	38.85	8.9	1957	970	109.0	0.032
7	Skykomish	12.3	20.5	16.4	8.2	1958	2	0.2	0.002
7	Skykomish	20.5	25	22.75	4.5	1958	0	0.0	0.000
7	Skykomish	25	34.4	29.7	9.4	1958	65	6.9	0.066
7	Skykomish	34.4	49.6	42	15.2	1958	37	2.4	0.023
7	Skykomish	12.3	20.5	16.4	8.2	1960	22	2.7	0.003
7	Skykomish	20.5	25	22.75	4.5	1960	216	48.0	0.055
7	Skykomish	25	34.4	29.7	9.4	1960	423	45.0	0.052
7	Skykomish	34.4	44.5	39.45	10.1	1960	203	20.1	0.023
7	Skykomish	44.5	51.5	48	7	1960	2	0.3	0.000
7	Skykomish	20.5	25	22.75	4.5	1962	61	13.6	0.034
7	Skykomish	25	34.4	29.7	9.4	1962	215	22.9	0.058
7	Skykomish	34.4	44.5	39.45	10.1	1962	100	9.9	0.025
7	Skykomish	44.5	51.5	48	7	1962	18	2.6	0.007
7	Skykomish	12.3	20.5	16.4	8.2	1963	101	12.3	0.014
7	Skykomish	20.5	25	22.75	4.5	1963	128	28.4	0.033
7	Skykomish	25	34.4	29.7	9.4	1963	285	30.3	0.035
7	Skykomish	34.4	44.5	39.45	10.1	1963	317	31.4	0.036
7	Skykomish	44.5	51.5	48	7	1963	35	5.0	0.006
7	Skykomish	12.3	20.5	16.4	8.2	1965	36	4.4	0.008
7	Skykomish	20.5	25	22.75	4.5	1965	119	26.4	0.046
7	Skykomish	25	34.4	29.7	9.4	1965	254	27.0	0.047
7	Skykomish	34.4	44.5	39.45	10.1	1965	159	15.7	0.028
7	Skykomish	44.5	51.5	48	7	1965	4	0.6	0.001
7	Skykomish	20.5	25	22.75	4.5	1966	116	25.8	0.049
7	Skykomish	25	34.4	29.7	9.4	1966	311	33.1	0.063
7	Skykomish	34.4	44.5	39.45	10.1	1966	98	9.7	0.018
7	Skykomish	12.3	20.5	16.4	8.2	1967	6	0.7	0.005
7	Skykomish	20.5	25.4	22.95	4.9	1967	22	4.5	0.031
7	Skykomish	25	34.4	29.7	9.4	1967	76	8.1	0.055
7	Skykomish	34.4	44.5	39.45	10.1	1967	43	4.3	0.029
7	Skykomish	12.3	20.5	16.4	8.2	1968	3	0.4	0.003
7	Skykomish	20.5	25	22.75	4.5	1968	25	5.6	0.038
7	Skykomish	25	34.4	29.7	9.4	1968	96	10.2	0.070
7	Skykomish	34.4	44.5	39.45	10.1	1968	22	2.2	0.015
7	Skykomish	12.3	20.5	16.4	8.2	1970	8	1.0	0.002
7	Skykomish	20.5	25	22.75	4.5	1970	53	11.8	0.026
7	Skykomish	25	34.4	29.7	9.4	1970	243	25.9	0.058
7	Skykomish	34.4	44.5	39.45	10.1	1970	126	12.5	0.028
7	Skykomish	44.5	51.5	48	7	1970	17	2.4	0.005

WRIA	River	Lower		RM Midpt	Seg			Count	Redd/mi	^Std. Density
		RM	Upper RM		Length	Year				
7	Skykomish	12.3	20.5	16.4	8.2	1971	6	0.7	0.002	
7	Skykomish	20.5	25	22.75	4.5	1971	64	14.2	0.045	
7	Skykomish	25	34.4	29.7	9.4	1971	182	19.4	0.061	
7	Skykomish	34.4	44.5	39.45	10.1	1971	65	6.4	0.020	
7	Skykomish	12.3	20.5	16.4	8.2	1972	4	0.5	0.004	
7	Skykomish	20.5	25	22.75	4.5	1972	11	2.4	0.021	
7	Skykomish	25	34.4	29.7	9.4	1972	74	7.9	0.068	
7	Skykomish	34.4	44.5	39.45	10.1	1972	27	2.7	0.023	
7	Skykomish	18	20.5	19.25	2.5	1973	7	2.8	0.004	
7	Skykomish	20.5	25	22.75	4.5	1973	97	21.6	0.031	
7	Skykomish	25	34.4	29.7	9.4	1973	344	36.6	0.053	
7	Skykomish	34.4	35.7	35.05	1.3	1973	30	23.1	0.034	
7	Skykomish	35.7	44.5	40.1	8.8	1973	210	23.9	0.035	
7	Skykomish	13.4	17	15.2	3.6	1974	13	3.6	0.007	
7	Skykomish	17	20.5	18.75	3.5	1974	22	6.3	0.013	
7	Skykomish	20.5	25	22.75	4.5	1974	41	9.1	0.018	
7	Skykomish	25	34.4	29.7	9.4	1974	224	23.8	0.048	
7	Skykomish	34.4	35.7	35.05	1.3	1974	22	16.9	0.034	
7	Skykomish	35.7	44.5	40.1	8.8	1974	115	13.1	0.026	
7	Skykomish	44.5	49.6	47.05	5.1	1974	8	1.6	0.003	
7	Skykomish	49.6	51.5	50.55	1.9	1974	49	25.8	0.052	
7	Skykomish	17.5	20.5	19	3	1975	2	0.7	0.004	
7	Skykomish	20.5	25	22.75	4.5	1975	26	5.8	0.032	
7	Skykomish	25	34.4	29.7	9.4	1975	105	11.2	0.062	
7	Skykomish	34.4	35.7	35.05	1.3	1975	4	3.1	0.017	
7	Skykomish	35.7	44.5	40.1	8.8	1975	23	2.6	0.015	
7	Skykomish	43.3	49.6	46.45	6.3	1975	3	0.5	0.003	
7	Skykomish	49.6	51.5	50.55	1.9	1975	17	8.9	0.050	
7	Skykomish	13.4	20.5	16.95	7.1	1976	12	1.7	0.005	
7	Skykomish	20.5	25	22.75	4.5	1976	38	8.4	0.023	
7	Skykomish	25	31.8	28.4	6.8	1976	137	20.1	0.056	
7	Skykomish	31.8	34.4	33.1	2.6	1976	66	25.4	0.071	
7	Skykomish	34.4	35.7	35.05	1.3	1976	9	6.9	0.019	
7	Skykomish	35.7	44.5	40.1	8.8	1976	80	9.1	0.025	
7	Skykomish	49.6	51.5	50.55	1.9	1976	18	9.5	0.026	
7	Skykomish	16.7	20.5	18.6	3.8	1978	6	1.6	0.004	
7	Skykomish	20.5	25	22.75	4.5	1978	87	19.3	0.046	
7	Skykomish	25	34.4	29.7	9.4	1978	167	17.8	0.042	
7	Skykomish	34.4	35.7	35.05	1.3	1978	38	29.2	0.069	
7	Skykomish	35.7	43.3	39.5	7.6	1978	110	14.5	0.034	
7	Skykomish	49.6	51.5	50.55	1.9	1978	16	8.4	0.020	
7	Skykomish	13.4	16.5	14.95	3.1	1979	6	1.9	0.004	
7	Skykomish	16.5	20.5	18.5	4	1979	28	7.0	0.013	
7	Skykomish	20.5	25	22.75	4.5	1979	45	10.0	0.019	
7	Skykomish	25	31.8	28.4	6.8	1979	149	21.9	0.041	
7	Skykomish	31.8	34.4	33.1	2.6	1979	81	31.2	0.058	
7	Skykomish	34.4	35.7	35.05	1.3	1979	50	38.5	0.072	
7	Skykomish	35.7	43.6	39.65	7.9	1979	148	18.7	0.035	
7	Skykomish	43.6	49.6	46.6	6	1979	8	1.3	0.002	
7	Skykomish	49.6	51.5	50.55	1.9	1979	20	10.5	0.020	

WRIA	River	Lower		RM Midpt	Seg			Count	Redd/mi	^Std. Density
		RM	Upper RM		Length	Year				
7	Skykomish	13.4	16.5	14.95	3.1	1980	12	3.9	0.010	
	Skykomish	16.5	20.5	18.5	4	1980	4	1.0	0.003	
	Skykomish	20.5	25	22.75	4.5	1980	29	6.4	0.017	
	Skykomish	25	34.4	29.7	9.4	1980	121	12.9	0.034	
	Skykomish	34.4	43.6	39	9.2	1980	171	18.6	0.049	
	Skykomish	43.6	49.6	46.6	6	1980	3	0.5	0.001	
	Skykomish	49.6	52.6	51.1	3	1980	40	13.3	0.035	
7	Skykomish	13.4	20.5	16.95	7.1	1981	0	0.0	0.000	
	Skykomish	20.5	25	22.75	4.5	1981	1	0.2	0.002	
	Skykomish	25	31.8	28.4	6.8	1981	26	3.8	0.040	
	Skykomish	31.8	34.4	33.1	2.6	1981	18	6.9	0.072	
	Skykomish	34.4	35.7	35.05	1.3	1981	0	0.0	0.000	
	Skykomish	35.7	43.6	39.65	7.9	1981	51	6.5	0.067	
	Skykomish	13.4	20.5	16.95	7.1	1983	2	0.3	0.002	
7	Skykomish	20.5	25	22.75	4.5	1983	14	3.1	0.018	
	Skykomish	25	31.8	28.4	6.8	1983	27	4.0	0.023	
	Skykomish	31.8	34.4	33.1	2.6	1983	37	14.2	0.082	
	Skykomish	34.4	35.7	35.05	1.3	1983	7	5.4	0.031	
	Skykomish	35.7	43.6	39.65	7.9	1983	86	10.9	0.063	
	Skykomish	13.4	20.5	16.95	7.1	1984	9	1.3	0.007	
	Skykomish	20.5	25	22.75	4.5	1984	20	4.4	0.023	
7	Skykomish	25	31.8	28.4	6.8	1984	37	5.4	0.028	
	Skykomish	31.8	34.4	33.1	2.6	1984	24	9.2	0.048	
	Skykomish	34.4	35.7	35.05	1.3	1984	12	9.2	0.048	
	Skykomish	35.7	43.5	39.6	7.8	1984	50	6.4	0.034	
	Skykomish	43.5	49.6	46.55	6.1	1984	6	1.0	0.005	
	Skykomish	49.6	51.5	50.55	1.9	1984	33	17.4	0.091	
	Skykomish	14.3	16.5	15.4	2.2	1985	0	0.0	0.000	
7	Skykomish	16.5	20.5	18.5	4	1985	1	0.3	0.001	
	Skykomish	20.5	25	22.75	4.5	1985	50	11.1	0.042	
	Skykomish	25	34.4	29.7	9.4	1985	105	11.2	0.042	
	Skykomish	34.4	35.7	35.05	1.3	1985	15	11.5	0.044	
	Skykomish	35.7	43.5	39.6	7.8	1985	57	7.3	0.028	
	Skykomish	43.6	49.6	46.6	6	1985	26	4.3	0.016	
	Skykomish	49.6	51.5	50.55	1.9	1985	10	5.3	0.020	
7	Skykomish	13.4	16.5	14.95	3.1	1986	0	0.0	0.000	
	Skykomish	16.5	20.5	18.5	4	1986	0	0.0	0.000	
	Skykomish	20.5	25	22.75	4.5	1986	23	5.1	0.021	
	Skykomish	25	31.8	28.4	6.8	1986	41	6.0	0.025	
	Skykomish	31.8	34.4	33.1	2.6	1986	55	21.2	0.089	
	Skykomish	34.4	35.7	35.05	1.3	1986	17	13.1	0.055	
	Skykomish	35.7	43.6	39.65	7.9	1986	33	4.2	0.017	
7	Skykomish	43.6	49.6	46.6	6	1986	3	0.5	0.002	
	Skykomish	49.6	51.5	50.55	1.9	1986	67	35.3	0.148	
	Skykomish	13.4	16.5	14.95	3.1	1987	0	0.0	0.000	
	Skykomish	16.5	20.5	18.5	4	1987	33	8.3	0.020	
	Skykomish	20.5	25	22.75	4.5	1987	89	19.8	0.048	
	Skykomish	25	31.8	28.4	6.8	1987	79	11.6	0.028	
	Skykomish	31.8	34.4	33.1	2.6	1987	80	30.8	0.074	
7	Skykomish	34.4	43.5	38.95	9.1	1987	92	10.1	0.024	
	Skykomish	43.5	49.6	46.55	6.1	1987	24	3.9	0.009	
7	Skykomish	49.6	51.5	50.55	1.9	1987	18	9.5	0.023	

WRIA	River	Lower		RM Midpt	Seg			Count	Redd/mi	^Std. Density
		RM	Upper RM		Length	Year				
7	Skykomish	16.5	20.5	18.5	4	1988	5	1.3	0.005	
7	Skykomish	20.5	25	22.75	4.5	1988	21	4.7	0.020	
7	Skykomish	25	31.8	28.4	6.8	1988	38	5.6	0.025	
7	Skykomish	31.8	34.4	33.1	2.6	1988	33	12.7	0.056	
7	Skykomish	34.4	43.5	38.95	9.1	1988	58	6.4	0.028	
7	Skykomish	43.6	49.6	46.6	6	1988	5	0.8	0.004	
7	Skykomish	49.6	51.5	50.55	1.9	1988	68	35.8	0.157	
7	Skykomish	13.4	16.5	14.95	3.1	1989	0	0.0	0.000	
7	Skykomish	16.5	20.5	18.5	4	1989	1	0.3	0.002	
7	Skykomish	20.5	25	22.75	4.5	1989	8	1.8	0.016	
7	Skykomish	25	34.4	29.7	9.4	1989	43	4.6	0.040	
7	Skykomish	34.4	43.5	38.95	9.1	1989	38	4.2	0.037	
7	Skykomish	43	49.6	46.3	6.6	1989	0	0.0	0.000	
7	Skykomish	49.6	51.5	50.55	1.9	1989	24	12.6	0.111	
7	Skykomish	13.4	16.5	14.95	3.1	1990	1	0.3	0.001	
7	Skykomish	16.5	20.5	18.5	4	1990	7	1.8	0.007	
7	Skykomish	20.5	25	22.75	4.5	1990	18	4.0	0.015	
7	Skykomish	25	31.8	28.4	6.8	1990	43	6.3	0.024	
7	Skykomish	31.8	34.4	33.1	2.6	1990	43	16.5	0.062	
7	Skykomish	34.4	43.3	38.85	8.9	1990	128	14.4	0.054	
7	Skykomish	43.3	49.6	46.45	6.3	1990	9	1.4	0.005	
7	Skykomish	49.6	51.5	50.55	1.9	1990	18	9.5	0.035	
7	Skykomish	13.4	16.5	14.95	3.1	1991	0	0.0	0.000	
7	Skykomish	16.5	20.5	18.5	4	1991	3	0.8	0.002	
7	Skykomish	20.5	25	22.75	4.5	1991	19	4.2	0.014	
7	Skykomish	25	31.8	28.4	6.8	1991	49	7.2	0.023	
7	Skykomish	31.8	34.4	33.1	2.6	1991	66	25.4	0.083	
7	Skykomish	34.4	43.3	38.85	8.9	1991	123	13.8	0.045	
7	Skykomish	43.3	49.6	46.45	6.3	1991	17	2.7	0.009	
7	Skykomish	49.6	51.5	50.55	1.9	1991	30	15.8	0.051	
7	Skykomish	13.4	16.5	14.95	3.1	1992	1	0.3	0.003	
7	Skykomish	16.5	20.5	18.5	4	1992	2	0.5	0.004	
7	Skykomish	20.5	25	22.75	4.5	1992	3	0.7	0.006	
7	Skykomish	25	31.8	28.4	6.8	1992	24	3.5	0.030	
7	Skykomish	31.8	34.4	33.1	2.6	1992	17	6.5	0.055	
7	Skykomish	34.4	43.3	38.85	8.9	1992	35	3.9	0.033	
7	Skykomish	43.3	49.2	46.25	5.9	1992	3	0.5	0.004	
7	Skykomish	49.6	51.5	50.55	1.9	1992	33	17.4	0.147	
7	Skykomish	13.4	16.5	14.95	3.1	1993	2	0.6	0.006	
7	Skykomish	16.5	20.5	18.5	4	1993	9	2.3	0.021	
7	Skykomish	20.5	25	22.75	4.5	1993	11	2.4	0.023	
7	Skykomish	25	31.8	28.4	6.8	1993	28	4.1	0.039	
7	Skykomish	31.8	34.4	33.1	2.6	1993	9	3.5	0.033	
7	Skykomish	34.4	43.6	39	9.2	1993	36	3.9	0.037	
7	Skykomish	43.3	49.6	46.45	6.3	1993	6	1.0	0.009	
7	Skykomish	49.6	51.5	50.55	1.9	1993	5	2.6	0.025	
7	Skykomish	20.5	25	22.75	4.5	1994	5	1.1	0.003	
7	Skykomish	25	31.8	28.4	6.8	1994	24	3.5	0.011	
7	Skykomish	31.8	34.4	33.1	2.6	1994	79	30.4	0.090	
7	Skykomish	34.4	43.3	38.85	8.9	1994	161	18.1	0.054	
7	Skykomish	43.3	49.6	46.45	6.3	1994	25	4.0	0.012	
7	Skykomish	49.6	51.5	50.55	1.9	1994	42	22.1	0.066	

WRIA	River	Lower		RM Midpt	Seg			Count	Redd/mi	^Std. Density
		RM	Upper RM		Length	Year				
7	Skykomish	13.4	20.5	16.95	7.1	1996	14	2.0	0.006	
7	Skykomish	20.5	25	22.75	4.5	1996	17	3.8	0.012	
7	Skykomish	25	31.8	28.4	6.8	1996	35	5.1	0.016	
7	Skykomish	31.8	34.4	33.1	2.6	1996	36	13.8	0.043	
7	Skykomish	34.4	43.6	39	9.2	1996	170	18.5	0.057	
7	Skykomish	43.6	49.6	46.6	6	1996	19	3.2	0.010	
7	Skykomish	49.6	51.5	50.55	1.9	1996	31	16.3	0.051	
7	Skykomish	13.4	20.5	16.95	7.1	1997	6	0.8	0.014	
7	Skykomish	20.5	25	22.75	4.5	1997	8	1.8	0.030	
7	Skykomish	25	34.4	29.7	9.4	1997	24	2.6	0.043	
7	Skykomish	34.4	43.6	39	9.2	1997	1	0.1	0.002	
7	Skykomish	43.6	49.6	46.6	6	1997	0	0.0	0.000	
7	Skykomish	49.6	51.5	50.55	1.9	1997	20	10.5	0.178	
7	Skykomish	13.4	20.5	16.95	7.1	1998	1	0.1	0.001	
7	Skykomish	20.5	25	22.75	4.5	1998	8	1.8	0.008	
7	Skykomish	25	34.4	29.7	9.4	1998	82	8.7	0.037	
7	Skykomish	34.4	43.6	39	9.2	1998	104	11.3	0.049	
7	Skykomish	43.6	49.6	46.6	6	1998	8	1.3	0.006	
7	Skykomish	49.6	51.5	50.55	1.9	1998	30	15.8	0.068	
7	Skykomish	13.4	51.5	32.45	38.1	1999	160	4.2	^b NA	
7	Skykomish	13.4	51.5	32.45	38.1	2000	115	3.0	NA	
7	Skykomish	13.4	51.5	32.45	38.1	2001	91	2.4	NA	
7	Snoqualmie	20.5	24.9	22.7	4.4	1954	95	21.6	0.204	
7	Snoqualmie	33.9	40.3	37.1	6.4	1954	11	1.7	0.016	
7	Snoqualmie	20.5	24.9	22.7	4.4	1956	182	41.4	0.117	
7	Snoqualmie	33.9	40.3	37.1	6.4	1956	171	26.7	0.076	
7	Snoqualmie	20.5	24.9	22.7	4.4	1957	1812	411.8	0.198	
7	Snoqualmie	33.9	40.3	37.1	6.4	1957	271	42.3	0.020	
7	Snoqualmie	20.5	24.9	22.7	4.4	1958	21	4.8	0.177	
7	Snoqualmie	33.9	40.3	37.1	6.4	1958	6	0.9	0.035	
7	Snoqualmie	20.5	24.9	22.7	4.4	1960	113	25.7	0.192	
7	Snoqualmie	33.9	40.3	37.1	6.4	1960	21	3.3	0.024	
7	Snoqualmie	20.5	24.9	22.7	4.4	1963	250	56.8	0.143	
7	Snoqualmie	33.9	40.3	37.1	6.4	1963	147	23.0	0.058	
7	Snoqualmie	20.5	24.9	22.7	4.4	1965	51	11.6	0.157	
7	Snoqualmie	33.9	40.3	37.1	6.4	1965	23	3.6	0.049	
7	Snoqualmie	20.5	24.9	22.7	4.4	1966	94	21.4	0.106	
7	Snoqualmie	33.9	40.3	37.1	6.4	1966	107	16.7	0.083	
7	Snoqualmie	20.5	24.9	22.7	4.4	1967	62	14.1	0.162	
7	Snoqualmie	33.9	40.3	37.1	6.4	1967	25	3.9	0.045	
7	Snoqualmie	20.5	24.9	22.7	4.4	1968	58	13.2	0.124	
7	Snoqualmie	33.9	40.3	37.1	6.4	1968	48	7.5	0.071	
7	Snoqualmie	20.5	24.9	22.7	4.4	1969	43	9.8	0.127	
7	Snoqualmie	33.9	40.3	37.1	6.4	1969	34	5.3	0.069	
7	Snoqualmie	20.5	24.9	22.7	4.4	1970	123	28.0	0.136	
7	Snoqualmie	33.9	40.3	37.1	6.4	1970	82	12.8	0.063	
7	Snoqualmie	20.5	24.9	22.7	4.4	1971	128	29.1	0.148	
7	Snoqualmie	33.9	40.3	37.1	6.4	1971	69	10.8	0.055	
7	Snoqualmie	20.5	24.9	22.7	4.4	1972	40	9.1	0.107	
7	Snoqualmie	33.9	40.3	37.1	6.4	1972	45	7.0	0.083	
7	Snoqualmie	20.5	24.9	22.7	4.4	1973	99	22.5	0.151	
7	Snoqualmie	33.9	40.3	37.1	6.4	1973	50	7.8	0.052	

WRIA	River	Lower		RM Midpt	Seg		Year	Count	Redd/mi	^Std. Density
		RM	Upper RM		Length					
7	Snoqualmie	20.5	24.9	22.7	4.4	1974	176	40.0	0.137	
7	Snoqualmie	33.9	40.3	37.1	6.4	1974	116	18.1	0.062	
7	Snoqualmie	20.5	24.9	22.7	4.4	1975	233	53.0	0.133	
7	Snoqualmie	33.9	40.3	37.1	6.4	1975	166	25.9	0.065	
7	Snoqualmie	20.5	24.9	22.7	4.4	1976	187	42.5	0.114	
7	Snoqualmie	33.9	40.3	37.1	6.4	1976	185	28.9	0.078	
7	Snoqualmie	20.5	24.9	22.7	4.4	1977	236	53.6	0.146	
7	Snoqualmie	33.9	40.3	37.1	6.4	1977	131	20.5	0.056	
7	Snoqualmie	20.5	24.9	22.7	4.4	1978	209	47.5	0.118	
7	Snoqualmie	33.9	40.3	37.1	6.4	1978	195	30.5	0.075	
7	Snoqualmie	20.5	24.9	22.7	4.4	1979	85	19.3	0.138	
7	Snoqualmie	33.9	40.3	37.1	6.4	1979	55	8.6	0.061	
7	Snoqualmie	20.5	24.9	22.7	4.4	1980	249	56.6	0.142	
7	Snoqualmie	33.9	40.3	37.1	6.4	1980	150	23.4	0.059	
7	Snoqualmie	20.5	24.9	22.7	4.4	1981	79	18.0	0.102	
7	Snoqualmie	33.9	40.3	37.1	6.4	1981	97	15.2	0.086	
7	Snoqualmie	20.5	24.9	22.7	4.4	1982	112	25.5	0.165	
7	Snoqualmie	33.9	40.3	37.1	6.4	1982	42	6.6	0.043	
7	Snoqualmie	20.5	24.9	22.7	4.4	1983	222	50.5	0.127	
7	Snoqualmie	33.9	40.3	37.1	6.4	1983	176	27.5	0.069	
7	Snoqualmie	20.5	24.9	22.7	4.4	1984	135	30.7	0.136	
7	Snoqualmie	33.9	40.3	37.1	6.4	1984	91	14.2	0.063	
7	Snoqualmie	20.5	24.9	22.7	4.4	1985	97	22.0	0.111	
7	Snoqualmie	33.9	40.3	37.1	6.4	1985	101	15.8	0.080	
7	Snoqualmie	20.5	23	21.75	2.5	1986	56	22.4	0.068	
7	Snoqualmie	23	24.9	23.95	1.9	1986	86	45.3	0.137	
7	Snoqualmie	33.9	36.1	35	2.2	1986	100	45.5	0.137	
7	Snoqualmie	36.1	39.6	37.85	3.5	1986	89	25.4	0.077	
7	Snoqualmie	20.5	23	21.75	2.5	1987	40	16.0	0.091	
7	Snoqualmie	23	24.9	23.95	1.9	1987	100	52.6	0.299	
7	Snoqualmie	33.9	36.1	35	2.2	1987	36	16.4	0.093	
7	Snoqualmie	36.1	39.6	37.85	3.5	1987	34	9.7	0.055	
7	Snoqualmie	20.5	23	21.75	2.5	1988	33	13.2	0.103	
7	Snoqualmie	23	24.9	23.95	1.9	1988	35	18.4	0.144	
7	Snoqualmie	33.9	36.1	35	2.2	1988	29	13.2	0.103	
7	Snoqualmie	36.1	39.6	37.85	3.5	1988	31	8.9	0.069	
7	Snoqualmie	20.5	23	21.75	2.5	1989	83	33.2	0.140	
7	Snoqualmie	23	24.9	23.95	1.9	1989	105	55.3	0.233	
7	Snoqualmie	33.9	36.1	35	2.2	1989	26	11.8	0.050	
7	Snoqualmie	36.1	39.6	37.85	3.5	1989	23	6.6	0.028	
7	Snoqualmie	20.5	23	21.75	2.5	1990	42	16.8	0.082	
7	Snoqualmie	23	24.9	23.95	1.9	1990	50	26.3	0.128	
7	Snoqualmie	33.9	36.1	35	2.2	1990	67	30.5	0.148	
7	Snoqualmie	36.1	39.6	37.85	3.5	1990	47	13.4	0.065	
7	Snoqualmie	20.5	23	21.75	2.5	1991	48	19.2	0.107	
7	Snoqualmie	23	24.9	23.95	1.9	1991	42	22.1	0.123	
7	Snoqualmie	33.9	36.1	35	2.2	1991	42	19.1	0.106	
7	Snoqualmie	36.1	39.6	37.85	3.5	1991	48	13.7	0.076	
7	Snoqualmie	20.5	23	21.75	2.5	1992	15	6.0	0.079	
7	Snoqualmie	23	24.9	23.95	1.9	1992	9	4.7	0.062	
7	Snoqualmie	33.9	36.1	35	2.2	1992	25	11.4	0.150	
7	Snoqualmie	36.1	39.6	37.85	3.5	1992	27	7.7	0.102	

WRIA	River	Lower		RM Midpt	Seg			Count	Redd/mi	^Std. Density
		RM	Upper RM		Length	Year				
7	Snoqualmie	33.9	36.1	35	2.2	1993	75	34.1	0.117	
7	Snoqualmie	36.1	39.6	37.85	3.5	1993	51	14.6	0.050	
7	Snoqualmie	20.5	23	21.75	2.5	1993	78	31.2	0.107	
7	Snoqualmie	23	24.9	23.95	1.9	1993	88	46.3	0.159	
7	Snoqualmie	20.5	23	21.75	2.5	1994	45	18.0	0.102	
7	Snoqualmie	23	24.9	23.95	1.9	1994	18	9.5	0.054	
7	Snoqualmie	33.9	36.1	35	2.2	1994	62	28.2	0.159	
7	Snoqualmie	36.1	39.6	37.85	3.5	1994	52	14.9	0.084	
7	Snoqualmie	32.8	36.1	34.45	3.3	1995	13	3.9	0.073	
7	Snoqualmie	36.1	39.6	37.85	3.5	1995	19	5.4	0.101	
7	Snoqualmie	20.5	23	21.75	2.5	1995	3	1.2	0.022	
7	Snoqualmie	23	24.9	23.95	1.9	1995	19	10.0	0.185	
7	Snoqualmie	33.9	36.1	35	2.2	1996	61	27.7	0.173	
7	Snoqualmie	36.1	39.6	37.85	3.5	1996	35	10.0	0.063	
7	Snoqualmie	20.5	23	21.75	2.5	1996	29	11.6	0.073	
7	Snoqualmie	23	24.9	23.95	1.9	1996	35	18.4	0.115	
7	Snoqualmie	20.5	23	21.75	2.5	1997	38	15.2	0.059	
7	Snoqualmie	23	24.9	23.95	1.9	1997	65	34.2	0.134	
7	Snoqualmie	32.8	36.1	34.45	3.3	1997	56	17.0	0.066	
7	Snoqualmie	36.1	39.6	37.85	3.5	1997	97	27.7	0.108	
7	Snoqualmie	20.5	24.9	22.7	4.4	1998	68	15.5	0.052	
7	Snoqualmie	32.8	39.6	36.2	6.8	1998	231	34.0	0.114	
7	Snoqualmie	20.5	24.9	22.7	4.4	1999	57	13.0	0.085	
7	Snoqualmie	32.8	39.6	36.2	6.8	1999	96	14.1	0.092	
7	Snoqualmie	32.8	39.6	36.2	6.8	2000	97	14.3	0.110	
7	Snoqualmie	20.5	24.9	22.7	4.4	2000	33	7.5	0.058	
7	Snoqualmie	20.5	24.9	22.7	4.4	2001	50	11.4	0.055	
7	Snoqualmie	32.8	39.6	36.2	6.8	2001	158	23.2	0.112	
7	Snoqualmie	20.5	24.9	22.7	4.4	2002	304	69.1	0.086	
7	Snoqualmie	32.8	39.6	36.2	6.8	2002	496	72.9	0.091	
7	Tolt/NF	0	6	3	6	1974	26	4.3	NA	
7	Tolt/NF	0	6	3	6	1975	8	1.3	NA	
7	Tolt/NF	0	6	3	6	1976	0	0.0	NA	
7	Tolt/NF	0	2	1	2	1977	16	8.0	NA	
7	Tolt/NF	0	2	1	2	1978	14	7.0	NA	
7	Tolt/NF	0	2	1	2	1979	4	2.0	NA	
7	Tolt/NF	0	2	1	2	1980	4	2.0	NA	
7	Tolt/NF	0	2	1	2	1981	2	1.0	NA	
7	Tolt/NF	0	2	1	2	1982	5	2.5	NA	
7	Tolt/NF	0	2	1	2	1983	11	5.5	NA	
7	Tolt/NF	0	2	1	2	1984	8	4.0	NA	
7	Tolt/NF	0	2	1	2	1985	12	6.0	NA	
7	Tolt/NF	0	2.2	1.1	2.2	1986	12	5.5	NA	
7	Tolt/NF	0	2.2	1.1	2.2	1987	4	1.8	NA	
7	Tolt/NF	0	2.8	1.4	2.8	1989	41	14.6	0.134	
7	Tolt/NF	2.8	5.7	4.25	2.9	1989	37	12.8	0.117	
7	Tolt/NF	5.7	8.8	7.25	3.1	1989	31	10.0	0.092	
7	Tolt/NF	0	5.7	2.85	5.7	1990	20	3.5	NA	
7	Tolt/NF	0	6	3	6	1991	29	4.8	NA	
7	Tolt/NF	0	6.1	3.05	6.1	1992	29	4.8	NA	
7	Tolt/NF	0	6	3	6	1993	103	17.2	NA	
7	Tolt/NF	0	6.1	3.05	6.1	1994	74	12.1	NA	

WRIA	River	Lower RM		RM Midpt	Seg Length			Year	Count	Redd/mi	^Std. Density
		RM	Upper RM		Length	Year					
7	Tolt/NF	0	6.1	3.05	6.1	1995		15	2.5	NA	
7	Tolt/NF	0	6.1	3.05	6.1	1996		75	12.3	NA	
7	Tolt/NF	0	6.1	3.05	6.1	1997		80	13.1	NA	
7	Tolt/NF	0	6.1	3.05	6.1	1998		26	4.3	NA	
7	Tolt/NF	0	6.1	3.05	6.1	1999		33	5.4	NA	
7	Tolt/NF	0	6.1	3.05	6.1	2000		37	6.1	NA	
7	Tolt/NF	0	6	3	6	2001		99	16.5	NA	
7	Tolt/NF	0	6	3	6	2002		182	30.3	0.125	
7	Tolt/NF	6	8.7	7.35	2.7	2002		60	22.2	0.092	
7	SF Tolt	0	1.6	0.8	1.6	1991		5	3.1	NA	
7	SF Tolt	0	1.6	0.8	1.6	1992		17	10.6	NA	
7	SF Tolt	0	1.6	0.8	1.6	1993		13	8.1	NA	
7	SF Tolt	0	1.6	0.8	1.6	1994		3	1.9	NA	
7	SF Tolt	0	1.6	0.8	1.6	1995		2	1.3	NA	
7	SF Tolt	0	1.6	0.8	1.6	1996		20	12.5	NA	
7	SF Tolt	0	1.6	0.8	1.6	1997		29	18.1	NA	
7	SF Tolt	0	1.6	0.8	1.6	1998		23	14.4	NA	
7	SF Tolt	0	1.6	0.8	1.6	1999		7	4.4	NA	
7	SF Tolt	0	1.6	0.8	1.6	2000		16	10.0	NA	
7	SF Tolt	0	1.6	0.8	1.6	2001		16	10.0	NA	
7	SF Tolt	0	1.6	0.8	1.6	2002		10	6.3	NA	
7	Raging	1.4	4.6	3	3.2	1989		55	17.2	0.286	
7	Raging	4.6	8	6.3	3.4	1989		5	1.5	0.025	
7	Raging	1.4	4.6	3	3.2	1990		37	11.6	0.269	
7	Raging	4.6	8	6.3	3.4	1990		6	1.8	0.041	
7	Raging	1.4	4.6	3	3.2	1991		4	1.3	NA	
7	Raging	1.4	4.6	3	3.2	1992		17	5.3	0.197	
7	Raging	4.6	8	6.3	3.4	1992		10	2.9	0.109	
7	Raging	0	8	4	8	1993		15	1.9	NA	
7	Raging	0	8	4	8	1995		54	6.8	NA	
7	Raging	0	0.4	0.2	0.4	1996		3	7.5	0.469	
7	Raging	0.4	2.5	1.45	2.1	1996		9	4.3	0.268	
7	Raging	2.5	4.6	3.55	2.1	1996		4	1.9	0.119	
7	Raging	0	4.6	2.3	4.6	1997		56	12.2	0.179	
7	Raging	4.6	8	6.3	3.4	1997		12	3.5	0.052	
7	Raging	0	4.6	2.3	4.6	1998		35	7.6	NA	
7	Raging	0	4.6	2.3	4.6	1999		52	11.3	NA	
7	Raging	0.4	4.8	2.6	4.4	2000		32	7.3	NA	
7	Raging	0	4.8	2.4	4.8	2001		184	38.3	NA	
7	Raging	0	4.6	2.3	4.6	2002		47	10.2	NA	
7	Tokul	0	0.3	0.15	0.3	1989		27	90.0	NA	
7	Tokul	0	0.3	0.15	0.3	1990		31	103.3	NA	
7	Tokul	0	0.3	0.15	0.3	1992		35	116.7	NA	
7	Tokul	0	0.3	0.15	0.3	1993		26	86.7	NA	
7	Tokul	0	0.3	0.15	0.3	1994		3	10.0	NA	
7	Tokul	0	0.3	0.15	0.3	1995		26	86.7	NA	
7	Tokul	0	0.3	0.15	0.3	1996		47	156.7	NA	
7	Tokul	0	0.3	0.15	0.3	1997		14	46.7	NA	
7	Tokul	0	0.3	0.15	0.3	1998		11	36.7	NA	
7	Tokul	0	0.3	0.15	0.3	1999		71	236.7	NA	
7	Tokul	0	0.5	0.25	0.5	2000		27	54.0	NA	
7	Tokul	0	1	0.5	1	2001		23	23.0	NA	

WRIA	River	Lower		RM Midpt	Seg			Count	Redd/mi	^Std. Density
		RM	Upper RM		Length	Year				
7	Tokul	0	0.3	0.15	0.3	2002	49	163.3	NA	
7	Tokul	0.3	0.6	0.45	0.3	2002	10	33.3	NA	
8	Cedar	0	1	0.5	1	1999	0	0.0	0.000	
8	Cedar	1	2	1.5	1	1999	2	2.0	0.011	
8	Cedar	2	3	2.5	1	1999	2	2.0	0.011	
8	Cedar	3	4	3.5	1	1999	1	1.0	0.006	
8	Cedar	4	5	4.5	1	1999	2	2.0	0.011	
8	Cedar	5	6.1	5.55	1.1	1999	21	19.1	0.106	
8	Cedar	6.1	7.05	6.575	0.95	1999	11	11.6	0.064	
8	Cedar	7.05	8	7.525	0.95	1999	5	5.3	0.029	
8	Cedar	8	9.1	8.55	1.1	1999	3	2.7	0.015	
8	Cedar	9.1	10.2	9.65	1.1	1999	11	10.0	0.056	
8	Cedar	10.2	11.25	10.725	1.05	1999	10	9.5	0.053	
8	Cedar	11.25	12.2	11.725	0.95	1999	5	5.3	0.029	
8	Cedar	12.2	13.35	12.775	1.15	1999	19	16.5	0.092	
8	Cedar	13.35	14.45	13.9	1.1	1999	18	16.4	0.091	
8	Cedar	14.45	15.4	14.925	0.95	1999	12	12.6	0.070	
8	Cedar	15.4	16.35	15.875	0.95	1999	11	11.6	0.064	
8	Cedar	16.35	17.4	16.875	1.05	1999	18	17.1	0.095	
8	Cedar	17.4	18.45	17.925	1.05	1999	13	12.4	0.069	
8	Cedar	18.45	19.6	19.025	1.15	1999	15	13.0	0.072	
8	Cedar	19.6	20.6	20.1	1	1999	0	0.0	0.000	
8	Cedar	20.6	21.6	21.1	1	1999	0	0.0	0.000	
8	Cedar	21.6	22.45	22.025	0.85	1999	1	1.2	0.007	
8	Cedar	0	1	0.5	1	2000	0	0.0	0.000	
8	Cedar	1	2	1.5	1	2000	0	0.0	0.000	
8	Cedar	2	3	2.5	1	2000	0	0.0	0.000	
8	Cedar	3	4	3.5	1	2000	1	1.0	0.019	
8	Cedar	4	5	4.5	1	2000	1	1.0	0.019	
8	Cedar	5	6.1	5.55	1.1	2000	0	0.0	0.000	
8	Cedar	6.1	7.05	6.575	0.95	2000	0	0.0	0.000	
8	Cedar	7.05	8	7.525	0.95	2000	0	0.0	0.000	
8	Cedar	8	9.1	8.55	1.1	2000	1	0.9	0.017	
8	Cedar	9.1	10.2	9.65	1.1	2000	9	8.2	0.154	
8	Cedar	10.2	11.25	10.725	1.05	2000	4	3.8	0.072	
8	Cedar	11.25	12.2	11.725	0.95	2000	0	0.0	0.000	
8	Cedar	12.2	13.35	12.775	1.15	2000	1	0.9	0.016	
8	Cedar	13.35	14.45	13.9	1.1	2000	5	4.5	0.086	
8	Cedar	14.45	15.4	14.925	0.95	2000	7	7.4	0.139	
8	Cedar	15.4	16.35	15.875	0.95	2000	7	7.4	0.139	
8	Cedar	16.35	17.4	16.875	1.05	2000	9	8.6	0.162	
8	Cedar	17.4	18.45	17.925	1.05	2000	7	6.7	0.126	
8	Cedar	18.45	19.6	19.025	1.15	2000	0	0.0	0.000	
8	Cedar	19.6	20.6	20.1	1	2000	1	1.0	0.019	
8	Cedar	20.6	21.6	21.1	1	2000	0	0.0	0.000	
8	Cedar	21.6	22.45	22.025	0.85	2000	0	0.0	0.000	
8	Cedar	0	1	0.5	1	2001	0	0.0	0.000	
8	Cedar	1	2	1.5	1	2001	0	0.0	0.000	
8	Cedar	2	3	2.5	1	2001	1	1.0	0.003	
8	Cedar	3	4	3.5	1	2001	3	3.0	0.008	
8	Cedar	4	5	4.5	1	2001	1	1.0	0.003	
8	Cedar	5	6.1	5.55	1.1	2001	20	18.2	0.047	
8	Cedar	6.1	7.05	6.575	0.95	2001	19	20.0	0.051	

WRIA	River	Lower		RM Midpt	Seg			Count	Redd/mi	^Std. Density
		RM	Upper RM		Length	Year				
8	Cedar	7.05	8	7.525	0.95	2001	7	7.4	0.019	
8	Cedar	8	9.1	8.55	1.1	2001	20	18.2	0.047	
8	Cedar	9.1	10.2	9.65	1.1	2001	47	42.7	0.110	
8	Cedar	10.2	11.25	10.725	1.05	2001	24	22.9	0.059	
8	Cedar	11.25	12.2	11.725	0.95	2001	19	20.0	0.051	
8	Cedar	12.2	13.35	12.775	1.15	2001	10	8.7	0.022	
8	Cedar	13.35	14.45	13.9	1.1	2001	30	27.3	0.070	
8	Cedar	14.45	15.4	14.925	0.95	2001	33	34.7	0.089	
8	Cedar	15.4	16.35	15.875	0.95	2001	36	37.9	0.097	
8	Cedar	16.35	17.4	16.875	1.05	2001	37	35.2	0.090	
8	Cedar	17.4	18.45	17.925	1.05	2001	41	39.0	0.100	
8	Cedar	18.45	19.6	19.025	1.15	2001	13	11.3	0.029	
8	Cedar	19.6	20.6	20.1	1	2001	21	21.0	0.054	
8	Cedar	20.6	21.6	21.1	1	2001	6	6.0	0.015	
8	Cedar	21.6	22.45	22.025	0.85	2001	2	2.4	0.006	
8	Cedar	0	1	0.5	1	2002	0	0.0	0.000	
8	Cedar	1	2	1.5	1	2002	1	1.0	0.004	
8	Cedar	2	3	2.5	1	2002	0	0.0	0.000	
8	Cedar	3	4	3.5	1	2002	1	1.0	0.004	
8	Cedar	4	5	4.5	1	2002	0	0.0	0.000	
8	Cedar	5	6.1	5.55	1.1	2002	10	9.1	0.034	
8	Cedar	6.1	7.05	6.575	0.95	2002	13	13.7	0.051	
8	Cedar	7.05	8	7.525	0.95	2002	6	6.3	0.023	
8	Cedar	8	9.1	8.55	1.1	2002	10	9.1	0.034	
8	Cedar	9.1	10.2	9.65	1.1	2002	12	10.9	0.041	
8	Cedar	10.2	11.25	10.725	1.05	2002	13	12.4	0.046	
8	Cedar	11.25	12.2	11.725	0.95	2002	11	11.6	0.043	
8	Cedar	12.2	13.35	12.775	1.15	2002	22	19.1	0.071	
8	Cedar	13.35	14.45	13.9	1.1	2002	33	30.0	0.112	
8	Cedar	14.45	15.4	14.925	0.95	2002	8	8.4	0.031	
8	Cedar	15.4	16.35	15.875	0.95	2002	13	13.7	0.051	
8	Cedar	16.35	17.4	16.875	1.05	2002	39	37.1	0.138	
8	Cedar	17.4	18.45	17.925	1.05	2002	19	18.1	0.067	
8	Cedar	18.45	19.6	19.025	1.15	2002	25	21.7	0.081	
8	Cedar	19.6	20.6	20.1	1	2002	20	20.0	0.074	
8	Cedar	20.6	21.6	21.1	1	2002	8	8.0	0.030	
8	Cedar	21.6	22.45	22.025	0.85	2002	5	5.9	0.022	
9	Green	25.4	26.7	26.05	1.3	1999	28	21.5	0.010	
9	Green	26.7	28.6	27.65	1.9	1999	107	56.3	0.025	
9	Green	28.6	29.7	29.15	1.1	1999	64	57.8	0.026	
9	Green	29.7	30	29.85	0.3	1999	55	181.9	0.082	
9	Green	30	30.6	30.3	0.6	1999	79	131.6	0.059	
9	Green	30.6	31.8	31.2	1.2	1999	114	95.2	0.043	
9	Green	31.8	33.3	32.55	1.5	1999	84	56.1	0.025	
9	Green	33.3	33.8	33.55	0.5	1999	137	274.0	0.123	
9	Green	33.8	34	33.9	0.2	1999	41	207.3	0.093	
9	Green	34	34.5	34.25	0.5	1999	117	234.0	0.105	
9	Green	34.5	35	34.75	0.5	1999	77	154.0	0.069	
9	Green	35	36.1	35.55	1.1	1999	111	100.9	0.045	
9	Green	36.1	37.2	36.65	1.1	1999	140	127.6	0.057	
9	Green	37.2	38	37.6	0.8	1999	135	169.1	0.076	
9	Green	38	39.2	38.6	1.2	1999	57	47.5	0.021	
9	Green	39.2	39.6	39.4	0.4	1999	107	267.5	0.120	

WRIA	River	Lower		RM Midpt	Seg			^Std.		
		RM	Upper RM		Length	Year	Count	Redd/mi	Density	
9	Green	39.6	40.7	40.15	1.1	1999	95	86.5	0.039	
9	Green	40.7	41.4	41.05	0.7	1999	45	63.8	0.029	
9	Green	41.4	41.6	41.5	0.2	1999	69	345.0	0.155	
9	Green	41.6	42.6	42.1	1	1999	25	24.9	0.011	
9	Green	42.6	43	42.8	0.4	1999	66	165.0	0.074	
9	Green	43	44.3	43.65	1.3	1999	46	35.6	0.016	
9	Green	44.3	45.3	44.8	1	1999	72	71.6	0.032	
9	Green	45.3	47	46.15	1.7	1999	8	4.5	0.002	
9	Green	47	48.2	47.6	1.2	1999	24	20.0	0.009	
9	Green	48.2	48.5	48.35	0.3	1999	52	173.3	0.078	
9	Green	48.5	51	49.75	2.5	1999	81	32.6	0.015	
9	Green	51	56.1	53.55	5.1	1999	4	0.8	0.000	
9	Green	56.1	57.6	56.85	1.5	1999	55	36.5	0.016	
9	Green	57.6	59.2	58.4	1.6	1999	9	5.4	0.002	
9	Green	59.2	60.4	59.8	1.2	1999	26	21.7	0.010	
9	Green	60.4	60.6	60.5	0.2	1999	83	415.0	0.187	
9	Green	60.6	61	60.8	0.4	1999	10	25.0	0.011	
9	Green	25.4	26.7	26.05	1.3	2000	25	19.2	0.011	
9	Green	26.7	28.6	27.65	1.9	2000	27	14.4	0.008	
9	Green	28.6	29.7	29.15	1.1	2000	23	20.9	0.012	
9	Green	29.7	30	29.85	0.3	2000	18	60.0	0.034	
9	Green	30	30.6	30.3	0.6	2000	96	159.8	0.089	
9	Green	30.6	31.8	31.2	1.2	2000	45	37.6	0.021	
9	Green	31.8	33.3	32.55	1.5	2000	18	12.2	0.007	
9	Green	33.3	33.8	33.55	0.5	2000	62	123.3	0.069	
9	Green	33.8	34	33.9	0.2	2000	46	230.0	0.129	
9	Green	34	34.5	34.25	0.5	2000	77	154.0	0.086	
9	Green	34.5	35	34.75	0.5	2000	29	58.1	0.033	
9	Green	35	36.1	35.55	1.1	2000	73	66.6	0.037	
9	Green	36.1	37.2	36.65	1.1	2000	126	114.8	0.064	
9	Green	37.2	38	37.6	0.8	2000	108	134.7	0.075	
9	Green	38	39.2	38.6	1.2	2000	42	35.0	0.020	
9	Green	39.2	39.6	39.4	0.4	2000	77	192.5	0.108	
9	Green	39.6	40.7	40.15	1.1	2000	50	45.5	0.025	
9	Green	40.7	41.4	41.05	0.7	2000	29	41.4	0.023	
9	Green	41.4	41.6	41.5	0.2	2000	27	135.0	0.076	
9	Green	41.6	42.6	42.1	1	2000	10	10.0	0.006	
9	Green	42.6	43	42.8	0.4	2000	37	92.5	0.052	
9	Green	43	44.3	43.65	1.3	2000	59	45.4	0.025	
9	Green	44.3	45.3	44.8	1	2000	120	119.6	0.067	
9	Green	45.3	47	46.15	1.7	2000	12	7.1	0.004	
9	Green	47	48.2	47.6	1.2	2000	47	39.4	0.022	
9	Green	48.2	48.5	48.35	0.3	2000	72	240.0	0.134	
9	Green	48.5	51	49.75	2.5	2000	156	62.3	0.035	
9	Green	51	56.1	53.55	5.1	2000	36	7.0	0.004	
9	Green	56.1	57.6	56.85	1.5	2000	64	42.6	0.024	
9	Green	57.6	59.2	58.4	1.6	2000	24	14.8	0.008	
9	Green	59.2	60.4	59.8	1.2	2000	8	6.9	0.004	
9	Green	60.4	60.6	60.5	0.2	2000	88	440.0	0.246	
9	Green	60.6	61	60.8	0.4	2000	56	140.6	0.079	

WRIA	River	Lower		RM Midpt	Seg			^Std.		
		RM	Upper RM		Length	Year	Count	Redd/mi	Density	
9	Green	25.4	26.7	26.05	1.3	2001	11	8.3	0.003	
9	Green	26.7	28.6	27.65	1.9	2001	17	8.7	0.004	
9	Green	28.6	29.7	29.15	1.1	2001	14	12.8	0.005	
9	Green	29.7	30	29.85	0.3	2001	19	63.3	0.026	
9	Green	30	30.6	30.3	0.6	2001	38	63.8	0.026	
9	Green	30.6	31.8	31.2	1.2	2001	37	30.7	0.012	
9	Green	31.8	33.3	32.55	1.5	2001	17	11.2	0.005	
9	Green	33.3	33.8	33.55	0.5	2001	54	107.9	0.044	
9	Green	33.8	34	33.9	0.2	2001	46	230.0	0.093	
9	Green	34	34.5	34.25	0.5	2001	152	304.0	0.123	
9	Green	34.5	35	34.75	0.5	2001	48	96.0	0.039	
9	Green	35	36.1	35.55	1.1	2001	65	58.8	0.024	
9	Green	36.1	37.2	36.65	1.1	2001	110	100.0	0.041	
9	Green	37.2	38	37.6	0.8	2001	97	121.2	0.049	
9	Green	38	39.2	38.6	1.2	2001	50	41.7	0.017	
9	Green	39.2	39.6	39.4	0.4	2001	132	330.0	0.134	
9	Green	39.6	40.7	40.15	1.1	2001	87	79.4	0.032	
9	Green	40.7	41.4	41.05	0.7	2001	41	58.1	0.024	
9	Green	41.4	41.6	41.5	0.2	2001	60	300.0	0.122	
9	Green	41.6	42.6	42.1	1	2001	20	20.0	0.008	
9	Green	42.6	43	42.8	0.4	2001	83	207.5	0.084	
9	Green	43	44.3	43.65	1.3	2001	88	67.4	0.027	
9	Green	44.3	45.3	44.8	1	2001	133	133.0	0.054	
9	Green	45.3	47	46.15	1.7	2001	45	26.5	0.011	
9	Green	47	48.2	47.6	1.2	2001	96	80.2	0.033	
9	Green	48.2	48.5	48.35	0.3	2001	117	390.0	0.158	
9	Green	48.5	51	49.75	2.5	2001	227	90.6	0.037	
9	Green	51	56.1	53.55	5.1	2001	21	4.2	0.002	
9	Green	56.1	57.6	56.85	1.5	2001	180	119.7	0.049	
9	Green	57.6	59.2	58.4	1.6	2001	87	54.1	0.022	
9	Green	59.2	60.4	59.8	1.2	2001	79	65.7	0.027	
9	Green	60.4	60.6	60.5	0.2	2001	140	700.0	0.284	
9	Green	60.6	61	60.8	0.4	2001	58	144.6	0.059	
9	Green	25.4	26.7	26.05	1.3	2002	27	20.7	0.007	
9	Green	26.7	28.6	27.65	1.9	2002	70	36.7	0.012	
9	Green	28.6	29.7	29.15	1.1	2002	38	34.3	0.012	
9	Green	29.7	30	29.85	0.3	2002	25	83.3	0.028	
9	Green	30	30.6	30.3	0.6	2002	123	205.0	0.070	
9	Green	30.6	31.8	31.2	1.2	2002	78	65.0	0.022	
9	Green	31.8	33.3	32.55	1.5	2002	24	15.9	0.005	
9	Green	33.3	33.8	33.55	0.5	2002	247	494.0	0.168	
9	Green	33.8	34	33.9	0.2	2002	161	805.0	0.273	
9	Green	34	34.5	34.25	0.5	2002	385	769.2	0.261	
9	Green	34.5	35	34.75	0.5	2002	76	152.0	0.052	
9	Green	35	36.1	35.55	1.1	2002	164	149.2	0.051	
9	Green	36.1	37.2	36.65	1.1	2002	145	131.8	0.045	
9	Green	37.2	38	37.6	0.8	2002	128	160.0	0.054	
9	Green	38	39.2	38.6	1.2	2002	56	47.1	0.016	
9	Green	39.2	39.6	39.4	0.4	2002	78	195.6	0.066	
9	Green	39.6	40.7	40.15	1.1	2002	93	84.9	0.029	
9	Green	40.7	41.4	41.05	0.7	2002	24	34.9	0.012	
9	Green	41.4	41.6	41.5	0.2	2002	65	325.0	0.110	
9	Green	41.6	42.6	42.1	1	2002	13	13.0	0.004	

WRIA	River	Lower		RM Midpt	Seg			^Std.		
		RM	Upper RM		Length	Year	Count	Redd/mi	Density	
9	Green	42.6	43	42.8	0.4	2002	74	185.0	0.063	
9	Green	43	44.3	43.65	1.3	2002	65	50.0	0.017	
9	Green	44.3	45.3	44.8	1	2002	108	107.8	0.037	
9	Green	45.3	47	46.15	1.7	2002	8	4.8	0.002	
9	Green	47	48.2	47.6	1.2	2002	44	36.7	0.012	
9	Green	48.2	48.5	48.35	0.3	2002	97	323.3	0.110	
9	Green	48.5	51	49.75	2.5	2002	105	42.1	0.014	
9	Green	51	56.1	53.55	5.1	2002	26	5.0	0.002	
9	Green	56.1	57.6	56.85	1.5	2002	126	83.8	0.028	
9	Green	57.6	59.2	58.4	1.6	2002	47	29.5	0.010	
9	Green	59.2	60.4	59.8	1.2	2002	55	45.8	0.016	
9	Green	60.4	60.6	60.5	0.2	2002	113	565.0	0.192	
9	Green	60.6	61	60.8	0.4	2002	57	141.9	0.048	

^aStandardized redd density = (redd/mi)/total number of redds in all segments for year.

^bNA: calculation of Std. Density not applicable for one survey segment.